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SAMS PHOTOFACT* SET No. 372

*TRADEMARK

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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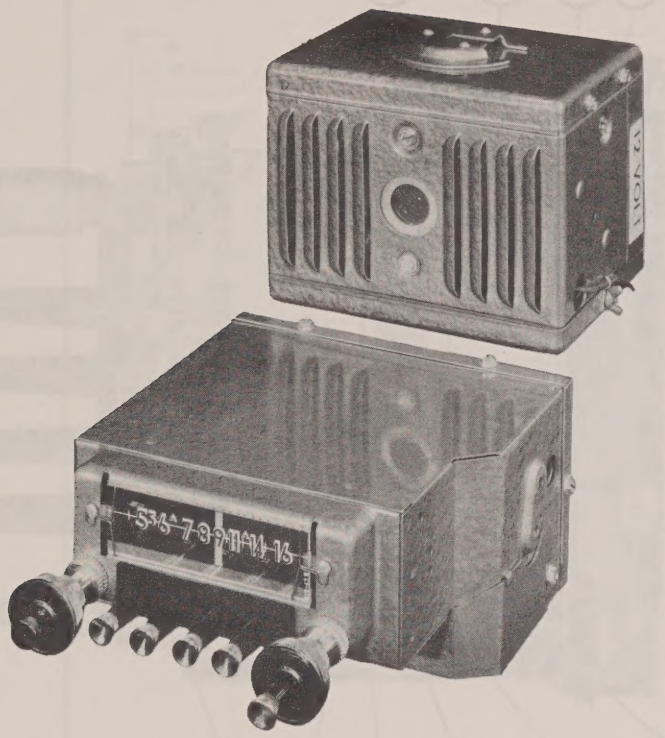
ALLSTATE MODELS 5028, 5033 (Ch. 528.50280, 528.50281, 528.50330, 528.50331)

ALLSTATE MODELS 5028, 5033 (Ch. 528.50280, 528.50281, 528.50330, 528.50331)



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALLSTATE MODELS 5028, 5033 (Ch. 528.50280, 528.50281, 528.50330, 528.50331)

TRADE NAME	Allstate Models 5028 (Ch. 528.50280, 528.50281), 5033 (Ch. 528.50330, 528.50331)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	Battery Operated Universal Type AM Automobile Receiver
TUBES (Six)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12BA6 IF Amplifier, 12CR6 Det.-AVC-AF Amp., 12AQ5 Output, 12X4 Rectifier (Equivalent 6 Volt Type Tubes Used in Model 5028)
POWER SUPPLY	12 Volt Storage Battery (Model 5033) RATING 3 Amp. @ 12.6 Volts DC (Model 5033) 6 Volt Storage Battery (Model 5028) 6 Amp. @ 6.3 Volts DC (Model 5028)
TUNING RANGE—BROADCAST	535 - 1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400~ Mod)	High frequency end of dial	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2	Fig. 1	High side thru dummy to antenna receptacle. Low side to chassis.	1610KC	"	"	A5	"
3	"	"	1400KC	Tune to 1400KC signal	"	A6, A7	"

PUSHBUTTON ADJUSTMENT

1. Turn pushbutton approximately one full turn counter clockwise.
2. Tune manually to desired station.
3. Press pushbutton in firmly and turn clockwise to lock in position.
4. Repeat procedure on remaining pushbuttons.

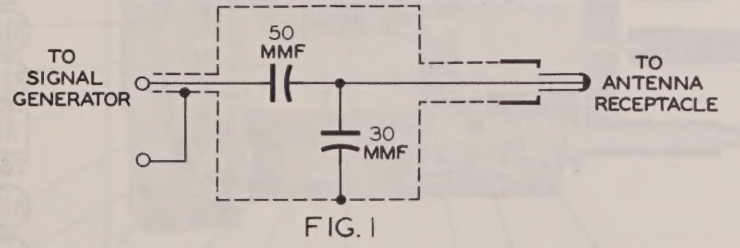


FIG. 1

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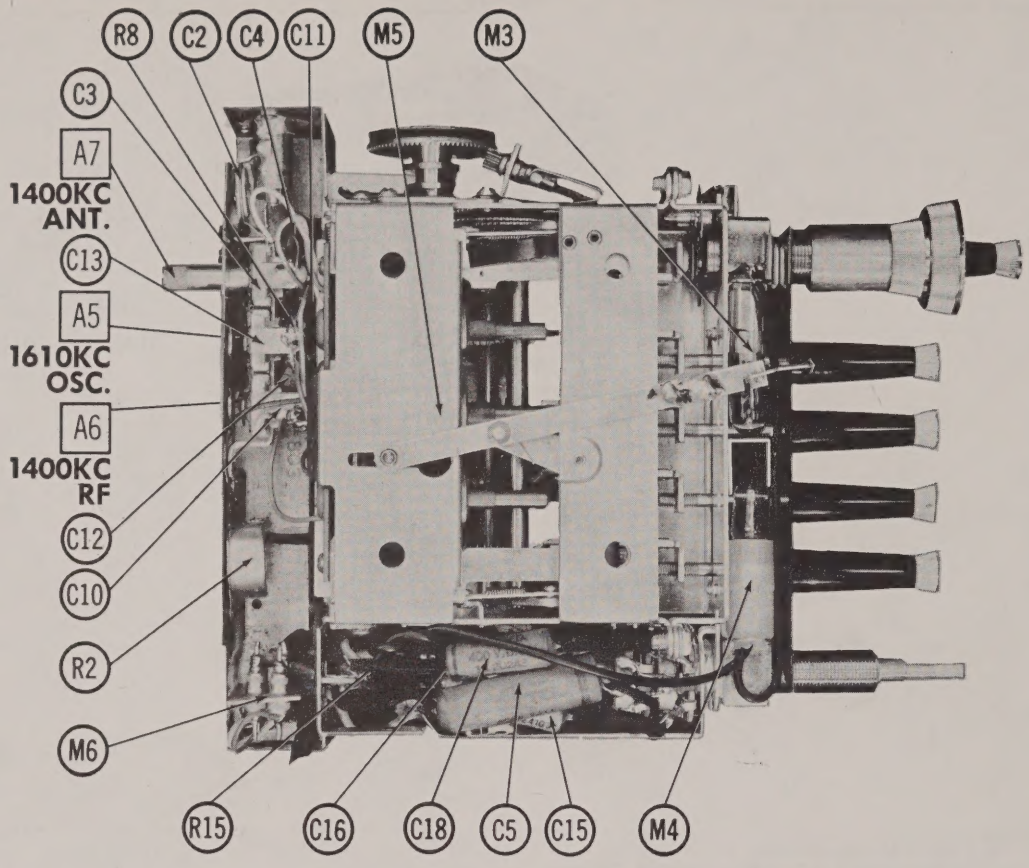
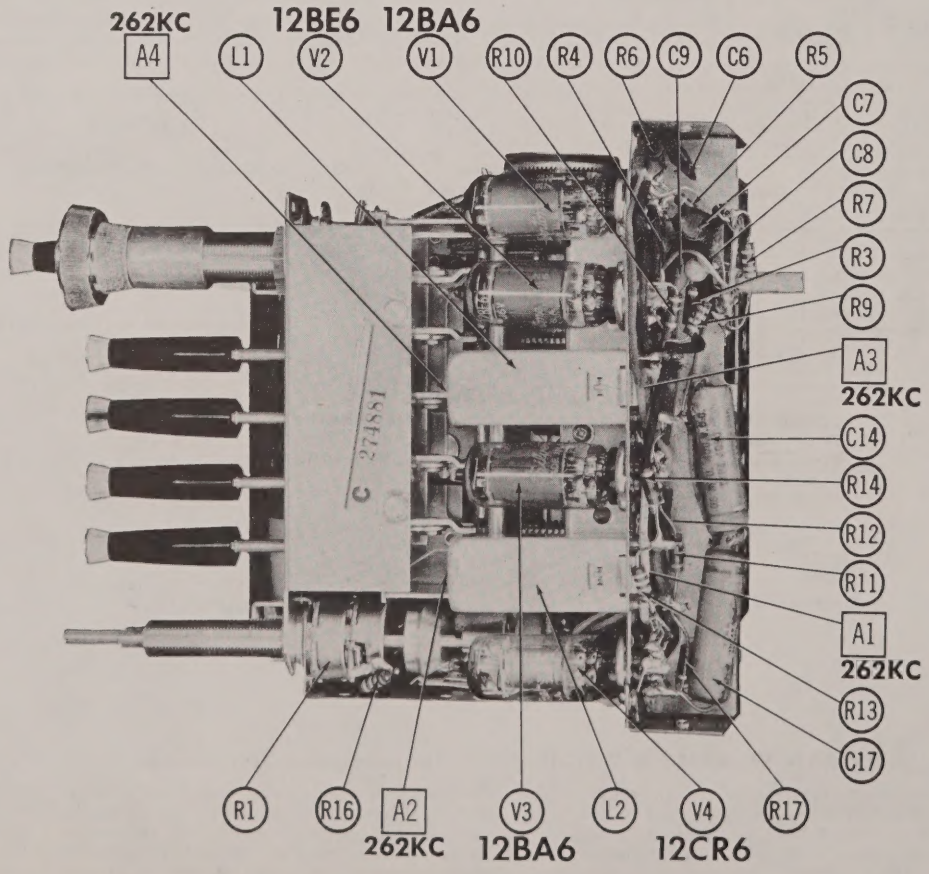
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of Hill the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



TUNER CHASSIS-TOP VIEW



TUNER CHASSIS-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	Note 1
V2	Converter	12BE6	Note 1
V3	IF Amplifier	12BA6	Note 1
V4	Det. -AVC-AF Amp.	12CR6	Note 1
V5	Output	12AQ5	Note 1
V6	Rectifier	12X4	Note 1

Note 1. Equivalent 6 volt type tubes used in chassis 528. 50280 & 528. 50281

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ALLSTATE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲35	400	T18-8-3	AFH3-132	D0550	FP365.7	TMQ-85	Q-307	TVL-4714
B	■25	350							
C	20	25							

FIXED CAPACITORS

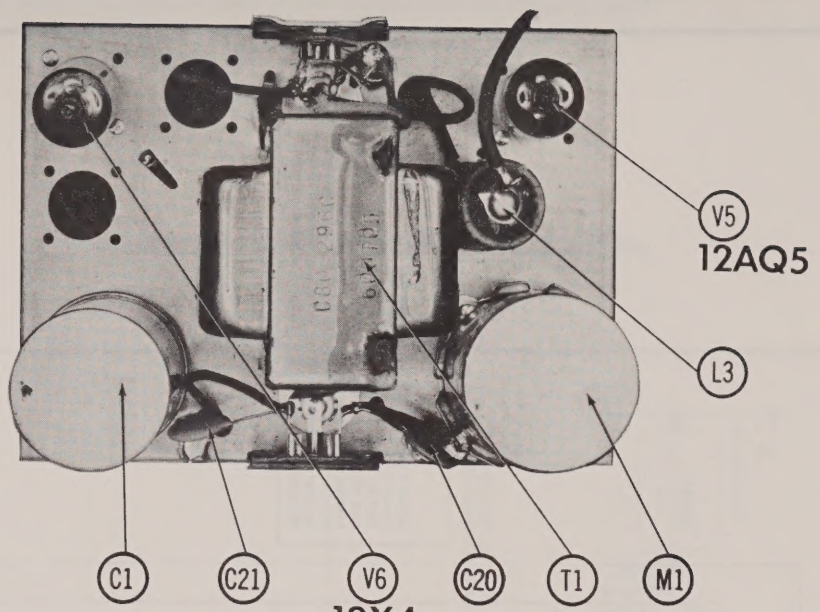
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ALLSTATE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	90		T19-1-1							
C3	15-160		T19-175-0							
C4	150	500	T17-15119	1469-00015	D6-151	22R5T15	ED-150	MCB236	MS-315	10%
C5	. 05	400	T16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C6	10000		T15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	47		T15-47016	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C8	220		T15-22111		D6-221	L10T22	ED-220			10%
C9	10		T15-10011		D6-100	L10Q1	ED-10		5TCC-Q1	10%
C10	18-140		T19-177-0							
C11	47		T15-47016	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C12	390	500	T17-39119	1469-00039	D6-391	5R5T39	ED-390		MS-339	10%
C13	125-250		T19-178-0							
C14	. 05	400	T16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C15	. 01	400	T16-10343	BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C16	. 01	400	T16-10343	BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C17	. 05	400	T16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C18	. 002	400	T16-20243	BPD-002	D6-202	CUB6D2	GP-2000	GEM-622	6TM-D2	
C19	. 02	600	T16-20353	BPD-02	DF-203	CUB6S2	ED-02	GEM-612	6TM-S2	
C20	5000		T15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C21	5000		T15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C22	. 2	400	T16-20443							
C23	5000		T15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C24	. 5	100	T20-8-1	P288N-5		CUB2P5		GEM-205	2TM-P5	
C25	. 5	100	T20-8-1	P288N-5		CUB2P5		GEM-205	2TM-P5	①
C26	. 0056	1600	T16-56278							②
C27	. 5	100	T20-8-1	P288N-5		CUB2P5		GEM-205	2TM-P5	

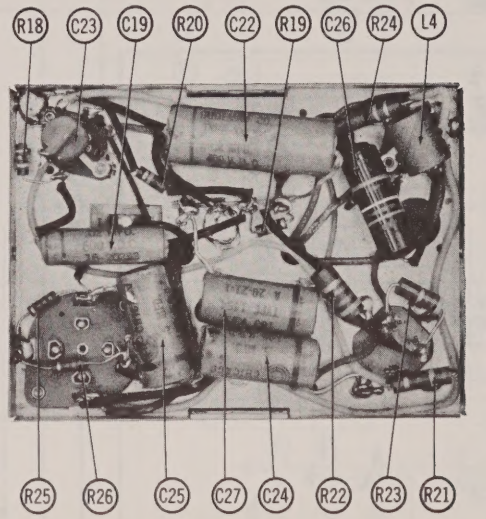
① Not used in chassis 528. 50280 & 528. 50281.
② Chassis 528. 50280 & 528. 50281 use . 0068MFD in this application (Part #T20-18-1).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ALLSTATE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	T24-249					Tone
B	250K	½						Volume, Tap③ 125K
C	Switch							
R2	560Ω	2	T61-50		39-600		FL-600	Sensitivity (Wire Wound)



POWER CHASSIS TOP VIEW



POWER CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ALLSTATE PART No.	IRC PART No.	
R3	1Meg		S60-10501	BTS-1Meg	
R4	18K		S60-18301	BTS-18K	
R5	680Ω		S60-68101	BTS-680	Note 3
R6	2200Ω		S60-22201	BTS-2200	Note 4
R7	39K		S60-39301	BTS-39K	Note 4
R8	330K		S60-33401	BTS-330K	
R9	47K		S60-47301	BTS-47K	
R10	330Ω		S60-33101	BTS-330	
R11	8200Ω		S60-82201	BTS-8200	
R12	68Ω		S60-68001	BTS-68	
R13	39K		S60-39301	BTS-39K	
R14	1Meg		S60-10501	BTS-1Meg	
R15	2.2Meg		S60-22501	BTS-2.2Meg	
R16	39K		S60-39301	BTS-39K	
R17	1Meg		S60-10501	BTS-1Meg	
R18	470K		S60-47402	BTS-470K	
R19	270K		S60-27401	BTS-270K	
R20	10Meg		S60-10601	BTS-10Meg	
R21	270Ω	1	S60-27111	BTA-270	
R22	8200Ω	2	S60-82221	BTB-8200	Note 5
R23	470Ω	1	S60-47111	BTA-470	
R24	10K	1	S60-10311	BTA-10K	Note 1
R25	220Ω		S60-22101	BTS-220	Note 2
R26	220Ω		S60-22101	BTS-220	Note 2

Note 1. Not used in chassis 528.50280, 528.50281.
Note 2. Chassis 528.50280, 528.50281 use a 100Ω (Part #S60-10101).
Note 3. Chassis 528.50330, 528.50280 use a 560Ω (Part #S60-56101).
Note 4. Not used in chassis 528.50280, 528.50330.
Note 5. Chassis 528.50280, 528.50330 use 10K, 1W (Part #S60-10311).

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	ALLSTATE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @ 1.6A 6.3VCT @ 2.75A	500VCT @ .050A 424VCT @ .040A			T80-296 ① T80-258 ②	V3902 ③ V3801	P-2860 P-2970	P-6494 ③ P-6301	22R79 22R61	V-31 ③ V-23Z

① Used in chassis 528.50330, 528.50331
② Used in chassis 528.50280, 528.50281
③ Use original shields.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ALLSTATE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4800Ω	3-4Ω	T80-251	Z1002	A-3019	A-3823	26S49	S-5Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ALLSTATE PART No.	QUAM PART No.	
SP1	7"	PM	3-4Ω	T79-410 ①	7A21	① Replace with same type as original.
	6" X 9"	PM	3-4Ω	T79-409 ①	69A3	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ALLSTATE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Input IF	T10-47-2				
L2	Output IF	T10-48-2				
L3	"A" Lead Choke	T33-234 ①				9 Microhenries
L4	Hash Choke	T10-5-5 ②				12 Microhenries

① Chassis 528.50330 use Part #T33-229
② Chassis 528.50280 use Part #T33-239

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				ALLSTATE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115~	T34-107 ①	6301	G1601/G859	6301	① Used in 12V versions
	Interrupter	6.3V	115~	T34-105 ②	5301	1601/859	5301	② Used in 6V versions

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ALLSTATE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	7AG	15A	T43-27	T84-2754 (Includes "A" Lead)	303015. (7AG 15A)	155009	AGW 15	HRH

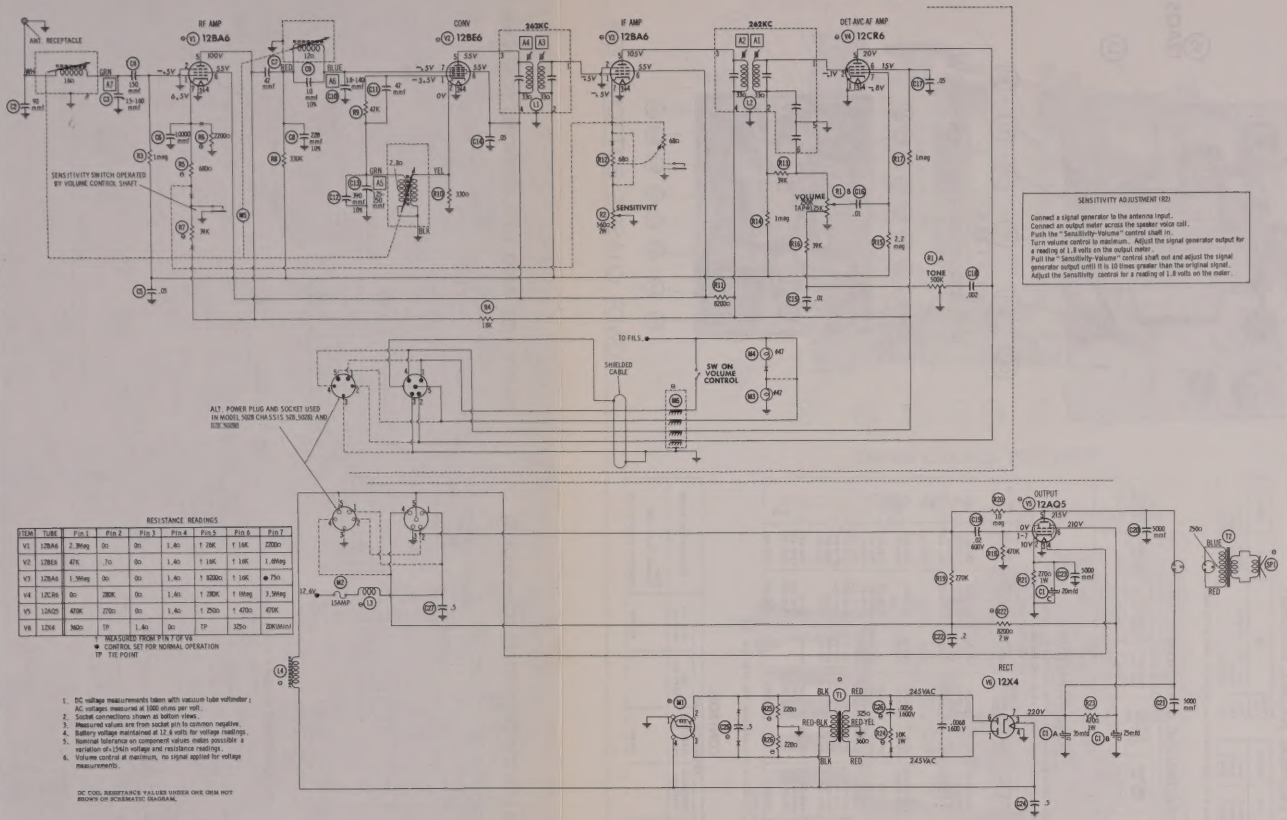
MISCELLANEOUS

ITEM No.	PART NAME	ALLSTATE PART No.	NOTES
M3	Dial Light	T89-7	#47
M4	Dial Light	T89-7	#47
M5	Tuner Ass'y.	T84-2215	
M6	Spark Plate	T84-2535	Includes Cable (Chassis 528.50330, 528.50331)
	Spark Plate	T84-2267	Includes Cable (Chassis 528.50280, 528.50281)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	T52-656	Tuning (Manual)
Knob	T52-654	Tone
Knob	T52-690	On-Off-Volume, Local-Distant Switch
Dial	T67-613	Upright
Dial	T67-612	Inverted
Pointer	T58-119	


ANT. RECEPTACLE
RF AMP
V1 12BA6
CONV
V2 12BE6
IF AMP
V3 12BA6
DET.AVC.AF AMP
V4 12CR6
SENSITIVITY SWITCH OPERATED BY VOLUME CONTROL SHAFT
SENSITIVITY
VOLUME
TONE
SENSITIVITY ADJUSTMENT (R2)
Connect a signal generator to the antenna input.
Connect an output meter across the speaker voice coil.
Push the "Sensitivity-Volume" control shaft in.
Turn volume control to maximum. Adjust the signal generator output for a reading of 1.8 volts on the output meter.
Pull the "Sensitivity-Volume" control shaft out and adjust the signal generator output until it is 10 times greater than the original signal.
Adjust the Sensitivity control for a reading of 1.8 volts on the meter.
ALT. POWER PLUG AND SOCKET USED IN MODEL 502B CHASSIS 52B, 502BJ AND 502BR
TO F.I.L.S.
SHIELDED CABLE
SW ON VOLUME CONTROL
OUTPUT
V5 12AQ5
RECT
V6 12X4
245VAC
220V
BLK
RED
RED-BLK
RED-YEL
BLUE
RESISTANCE READINGS
MEASURED FROM PIN 7 OF V6
CONTROL SET FOR NORMAL OPERATION
TP TIE POINT
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

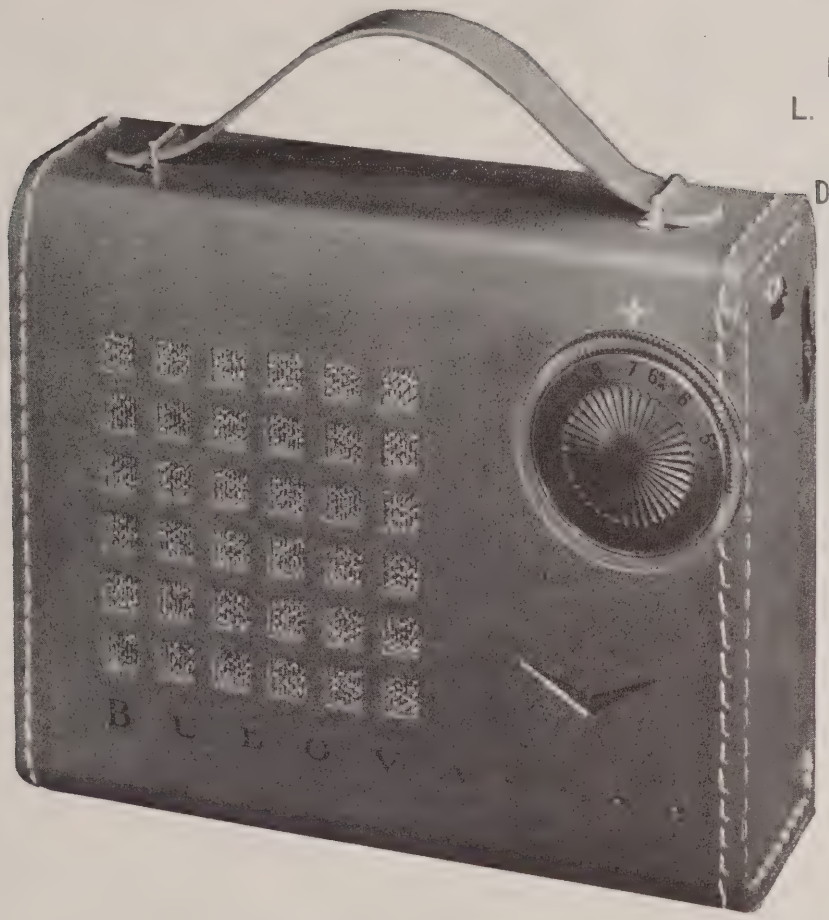
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	2.3Meg	0Ω	0Ω	1.4Ω	↑ 20K	↑ 16K	220Ω
V2	12BE6	47K	.7Ω	0Ω	1.4Ω	↑ 16K	↑ 16K	1.6Meg
V3	12BA6	1.5Meg	0Ω	0Ω	1.4Ω	↑ 820Ω	↑ 16K	● 75Ω
V4	12CR6	0Ω	28K	0Ω	1.4Ω	↑ 28K	↑ 1Meg	3.5Meg
V5	12AQ5	470K	270Ω	0Ω	1.4Ω	↑ 250Ω	↑ 470Ω	470K
V6	12X4	360Ω	TP	1.4Ω	0Ω	TP	325Ω	20K(AVG)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

BULOVA
MODELS 220 Series, 230 Series

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

BULOVA
MODELS 220 Series, 230 Series



BULOVA
MODELS 220 Series, 230 Series

TRADE NAME	Bulova Models #220 Series, 230 Series
MANUFACTURER	Electronics Guild, Inc., Sunrise Highway, Valley Stream, Long Island, N.Y.
TYPE SET	Battery Operated Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY	1.5 Volts "A" Supply & 67.5 Volts "B" Supply RATING 130MA @ 1.5 Volts DC & 8.4MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1640KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1640KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det.-AVC-AF Amp.	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BULOVA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	100		SRE150V10	BBR10-150	TC42			TVA-1406

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	BULOVA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200		BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	
C3	2000			BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C4	2000			BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C5	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	100			BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C7	2000			BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C8	2000			BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BULOVA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1Meg	1/4						Volume

RESISTORS

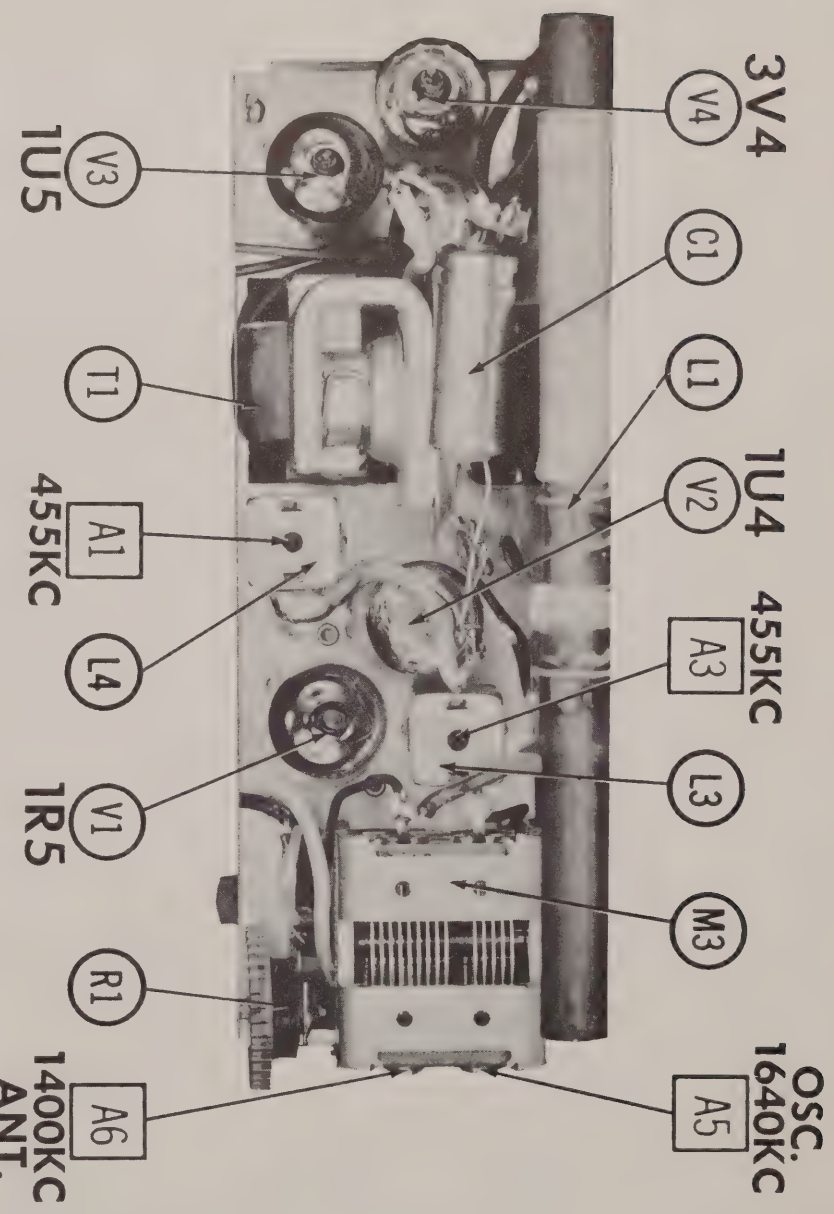
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BULOVA PART No.	IRC PART No.	
R2	100K			BTS-100K	
R3	15K			BTS-15K	
R4	3.3Meg			BTS-3.3Meg	
R5	10Meg			BTS-10Meg	
R6	1Meg 5%			BTS-1Meg 5%	
R7	4.7Meg			BTS-4.7Meg	
R8	1Meg			BTS-1Meg	
R9	390Ω			BTS-390	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	BULOVA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	8800Ω	3-4Ω	E1110		A-2927①		24S83 ②	S-11Z ①	① Bend ears down. ② Use original channel mounting frame.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	BULOVA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	E1013	4A06	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		BULOVA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick			BC-419		
L2	Osc. Coil					
L3	Input IF		16-6800	BC-357	10-C1	
L4	Output IF		16-6801	BC-358	10-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	BULOVA PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	150MMF, 150MMF, 47K		Aerovox	PA-98
				Centralab	PC-51
				Cornell-Dubilier	111TM2
				Erie	1403-02
				Sprague	D-2

BATTERIES

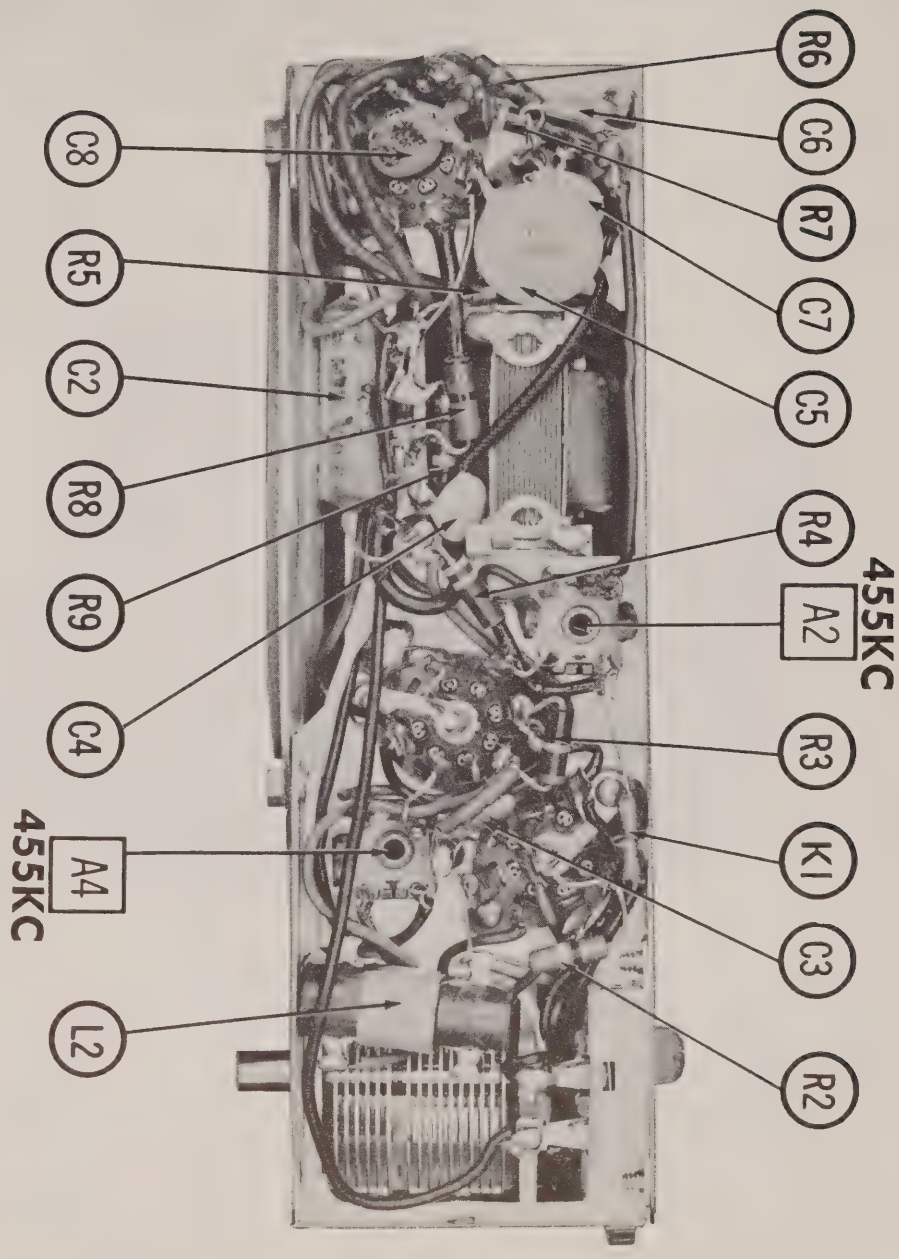
ITEM No.	VOLTAGE	BULOVA PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	*	1		935		M-14		1LP		Note 1
M2	67½V	#149 *		P45		477		M-211P		211P	

Note 1. Connect two in parallel.
* Battery Kit (Part #231A), consisting of six 1.5V "C" size and one 67½ V batteries, is available.

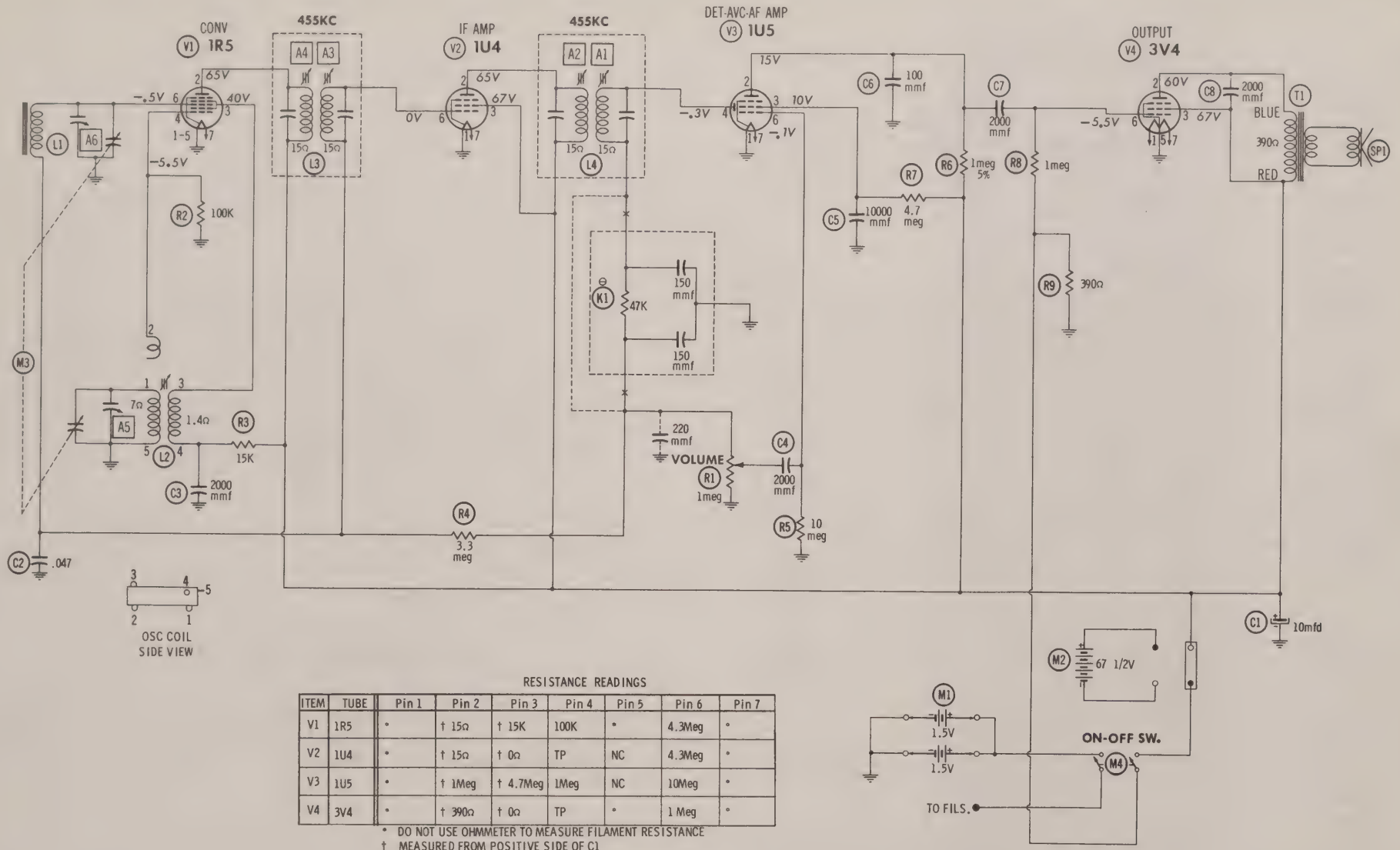
MISCELLANEOUS

ITEM No.	PART NAME	BULOVA PART No.	NOTES
M3	Tuning Cap.		2 Gang (Ant. 28-255MMF, Osc. 12-115MMF)
M4	Switch		On-off (Slide Type STDT)

CHASSIS—BOTTOM VIEW



BULOVA
MODEL #220 Series



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	•	† 15Ω	† 15K	100K	•	4.3Meg	•
V2	1U4	•	† 15Ω	† 0Ω	TP	NC	4.3Meg	•
V3	1U5	•	† 1Meg	† 4.7Meg	1Meg	NC	10Meg	•
V4	3V4	•	† 390Ω	† 0Ω	TP	•	1 Meg	•

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM POSITIVE SIDE OF C1
TP TIE POINT
NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

DUMONT
CHASSIS RA-394, RA-395

DUMONT
CHASSIS RA-394, RA-395

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DUMONT
CHASSIS RA-394, RA-395

TRADE NAME	Dumont Chassis RA-394, RA-395
MANUFACTURER	Allen B. Dumont Laboratories Inc., 257 Sixteenth Ave., Passaic, N. J.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Five)	Types 6AV6 Preamplifier, 12AX7 AF Amp.-Phase Inv., (2) 6VGT Output, 5Y3GT Rectifier (Chassis RA-395 has 4 6V6GT Output Tubes)
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .6 Amp. @ 117 Volts AC (60 Watts)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 1200A - PHOTOFACT SET 353 FOLDER 16

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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H133

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Pre-amplifier	6AV6	
V2	AF Amp. - Phase Inv.	12AX7	
V3	Output	6V6GT	

ITEM No.	USE	TYPE	NOTES
V4	Output	6V6GT	
V5	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DUMONT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▬40	450	03190511	AFH4-78	D0640	FP429	TMQ-92	Q-380	TVL-4734
B	■30	450							
C	▲10	450							
D	20	25							
C2	20	25	03190206	PRS50V20	BBR20-25	TC45	TD-20-150	MT-1520	TVA-1205
C3	25	25NP	03125743	NP-PRS30V20	BBR50-25† BBR50-25†	TC29† TC29†	TD-50-25† TD-50-25†	MT-0250† MT-0250†	R2460 *

† Connect negative leads together
* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

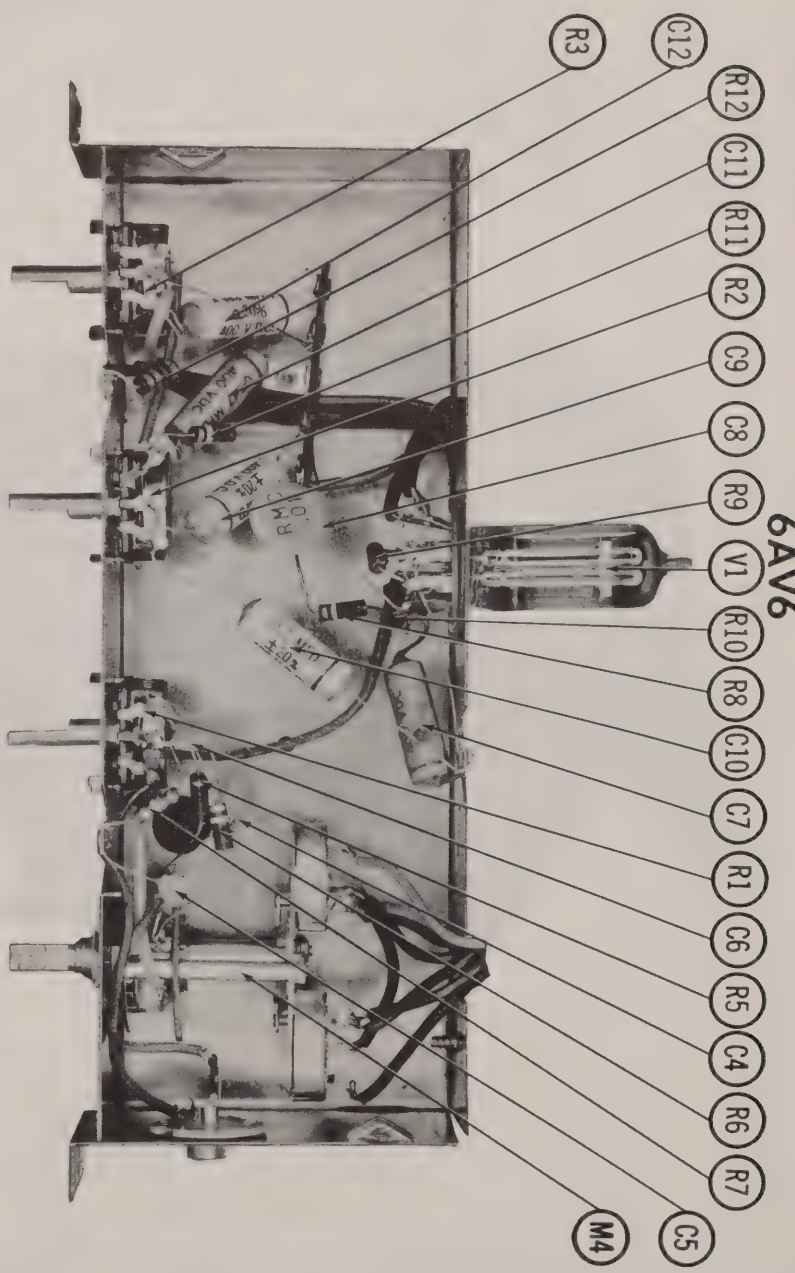
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DUMONT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	33		03177330	BPD-000033	DD-330	L10Q33	ED-33	UC-5433	5GA-Q33	
C5	680		03174090	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C6	47		03177340	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C7	.0047	400	03141040	BPD-0047	DD-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C8	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	10% ①
C9	.0015	400	03141010	BPD-0015	DD-152	CUB6D15	GP-1500	GEM-6215	6TM-D15	
C10	.001	400	03141000	BPD-001	DD-102	CUB6D1	GP-1000	GEM-421	6TM-D1	
C11	.0047	400	03141040	BPD-0047	DD-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C12	.0033	400	03141030	BPD-0033	DD-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C13	470		03174080	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C14	.047	600	03141100	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C15	.047	600	03141100	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C16	10000	900 VAC	03190241							

① Some versions use 4700MMF (Part #03141040)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DUMONT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	01011187	B-70	A47-1Meg-Z	Q13-137	TA16A	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1Meg	½	01011188	B-69	A47-1Meg-S	Q11-137	TA16L	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1Meg	½	01011187	B-70	A47-1Meg-Z	Q13-137	TA16A	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	50Ω	2	01069592	WN-500	A43-50	WPK50	R50L	Hum Balance (Wire Wound)
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DUMONT PART No.	IRC PART No.	
R5	1.5Meg		02252150	BTS-1.5Meg	
R6	100K		02252010	BTS-100K	
R7	330K			BTS-330K	Note 1
R8	220K		02252050	BTS-220K	
R9	3300Ω		02251830	BTS-3300	
R10	1500Ω		02251750	BTS-1500	
R11	220K		02252050	BTS-220K	
R12	47K		02251970	BTS-47K	
R13	470K		02252090	BTS-470K	
R14	47K		02251970	BTS-47K	
R15	470K		02252090	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DUMONT PART No.	IRC PART No.	
R16	3300Ω		02251830	BTS-3300	
R17	220Ω		02251690	BTS-220	
R18	2700Ω		02251820	BTS-2700	
R19	18K		02251920	BTS-18K	
R20	470K		02252090	BTS-470K	
R21	6800Ω		02251870	BTS-6800	
R22	220K		02252050	BTS-220K	
R23	220K		02252050	BTS-220K	
R24	270Ω	2	02257700	BTB-270	
R25	100K		02252010	BTS-100K	
R26	470Ω	2	02257730	BTB-470	

Note 1. 220K may be used in some versions (Part #02252050)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	DUMONT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ② .6A	580VCT ② .080A	5VAC ② 3A	6.3VAC ② 1.6A	20011181 ① 20011182 ②					

① Used in chassis RA-394
② Used in chassis RA-395

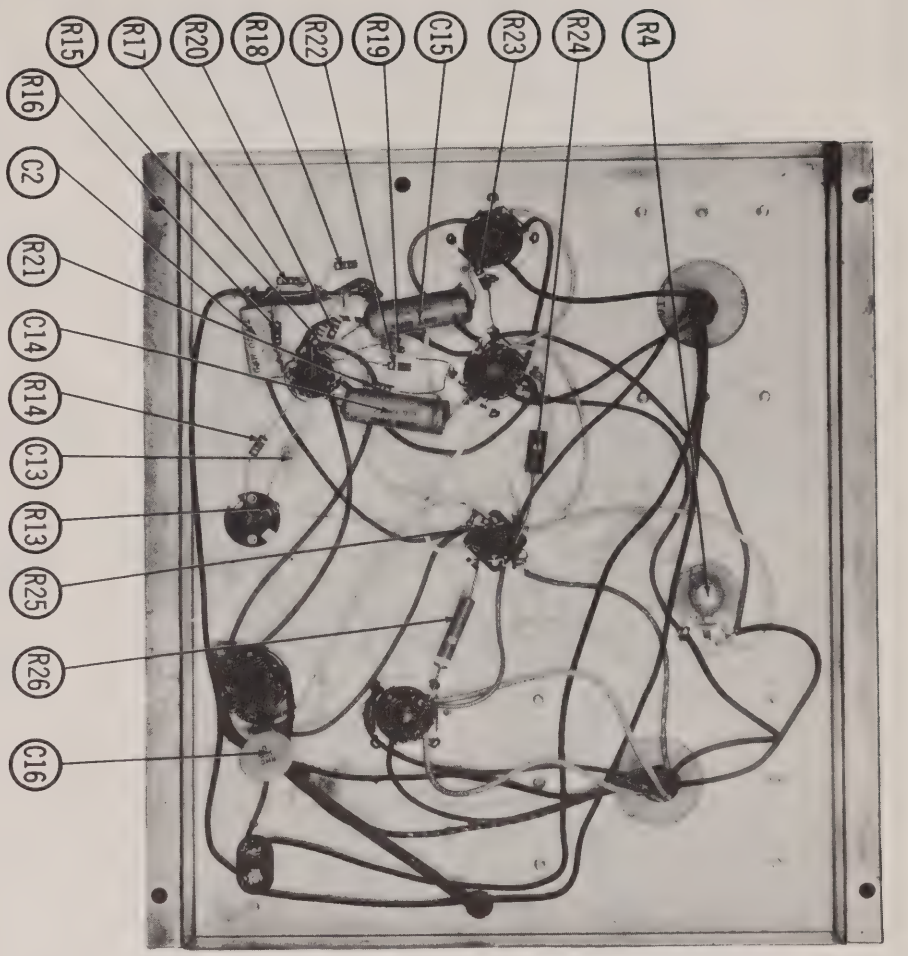
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DUMONT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6300Ω CT	3-4Ω	20011171 ① 20011172 ②		A-3102 ③ ④	A-3872 ③	22S98 ③	HSM-186 ③	① Used in Chassis RA-394 ② Used in Chassis RA-395 ③ Drill new mounting holes. ④ Tape screen taps.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DUMONT PART No.	QUAM PART No.	
SP1	4"	PM	6-8Ω	18004092 ①	4A1Z6.7 ①	① Parallel and Phase
SP2	4"	PM	6-8Ω	18004092 ①	4A1Z6.7 ①	
SP3	12"	PM	6-8Ω	18004081 ①	12A6 ①	
SP4	12"	PM	6-8Ω	18004082 ①	12A6 ①	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	DUMONT PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1		118TS	N8-1 or N8-3	56	PT-1	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED . FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

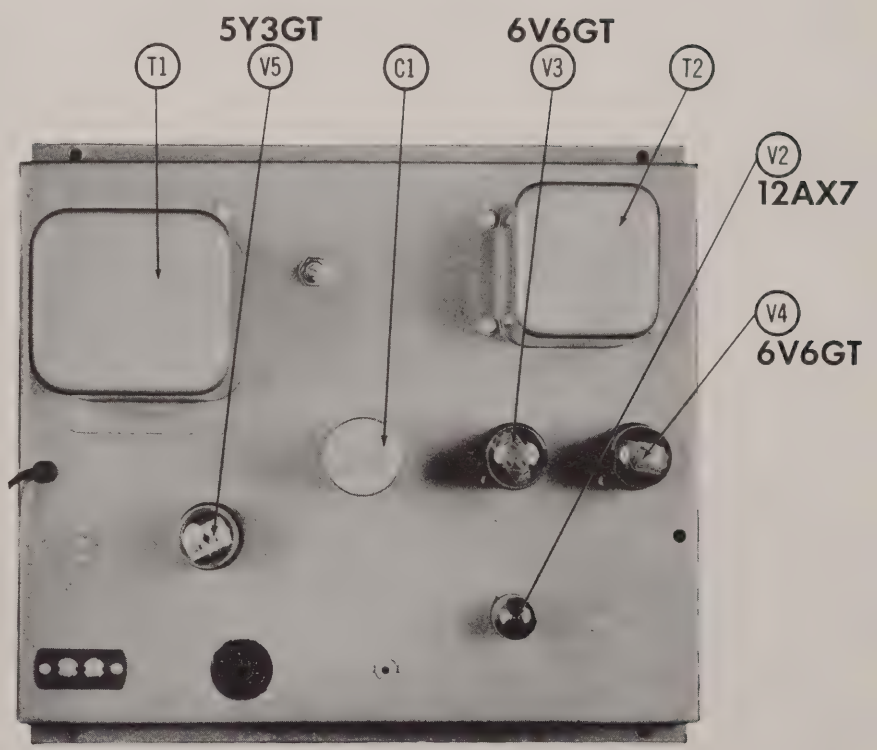
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

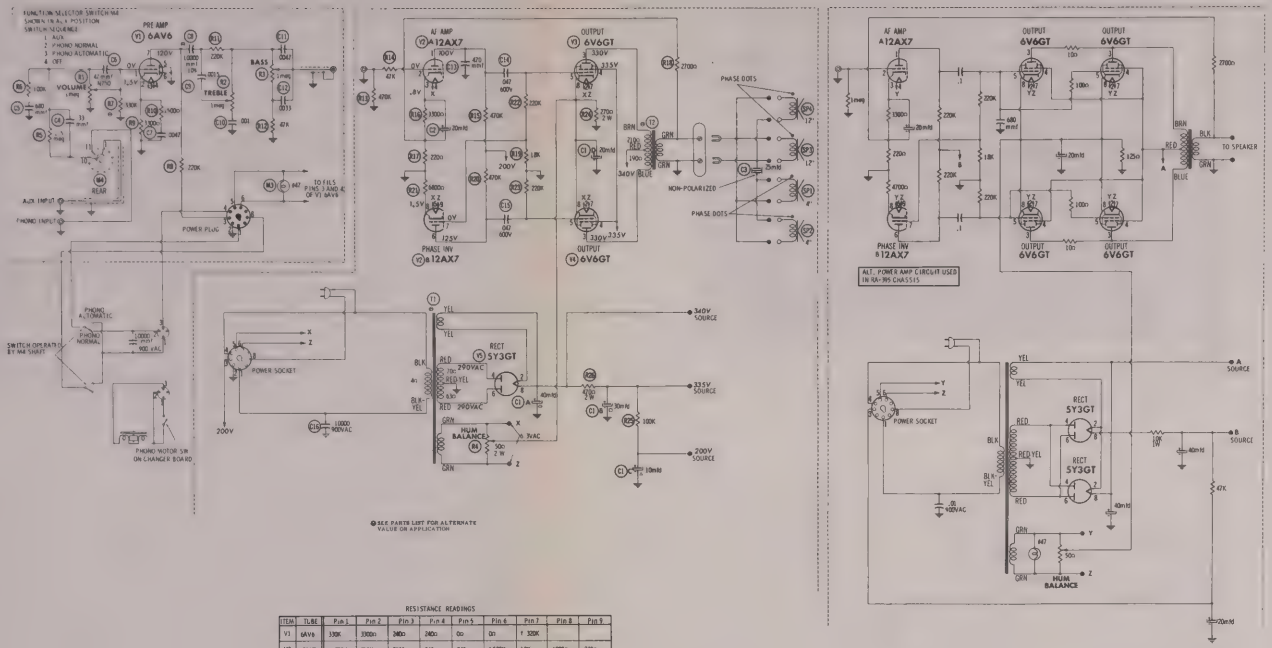
ITEM No.	REPLACEMENT DATA			REMARKS
	DUMONT PART No.	JENSEN PART No.	WALCO PART No.	
M2		† CRA-55 or ♦ CRA-55D and † CRA-55LP or ♦ CRA-55LPD	† W-64S or ♦ W-64D and † W-64MGS ♦ W-64MGD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	DUMONT PART No.	NOTES
M3	Pilot Light	12001310	#47
M4	Switch Knob	05012901 45006501	Selector, On-Off (Wafer Rotary Type) Control

CHASSIS—TOP VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AV6	330K	330Ω	240Ω	240Ω	0Ω	0Ω	† 320K		
V2	12AX7	† 570K	515K	350Ω	240Ω	240Ω	† 570K	1.8K	6800Ω	240Ω
V3	6V6GT	NC	240Ω	† 210Ω	† 470Ω	240K	NC	240Ω	270Ω	
V4	6V6GT	NC	240Ω	† 190Ω	† 470Ω	220K	NC	240Ω	270Ω	
V5	5Y3GT	NC	220K(Min)	NC	70Ω	NC	63Ω	NC	220K(Min)	

† MEASURED FROM PIN 8 OF V5
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected

EMERSON MODELS 851B, 852B, 853B (Ch. 120327B, 120334B, 120335B)

PROPERTY OF
L. F. BLANKENSHIP
3324 MEADE ST.
DENVER, COLO.

EMERSON MODELS 851B, 852B, 853B (Ch. 120327B, 120334B, 120335B)

EMERSON MODELS 851B, 852B, 853B (Ch. 120327B, 120334B, 120335B)

TRADE NAME	Emerson Models 851B (Ch. 120327B), 852B (Ch. 120334B), 853B (Ch. 120335B)
MANUFACTURER	Emerson Radio & Phono Corp., 14th. & Coles Sts., Jersey City 2, N. J.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 (or) 12AT6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC
RATING	.28 Amp. @ 117 Volts AC (27 Watts)
TUNING RANGE—BROADCAST	540 - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.005MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune to 1400KC signal	"	A6	"

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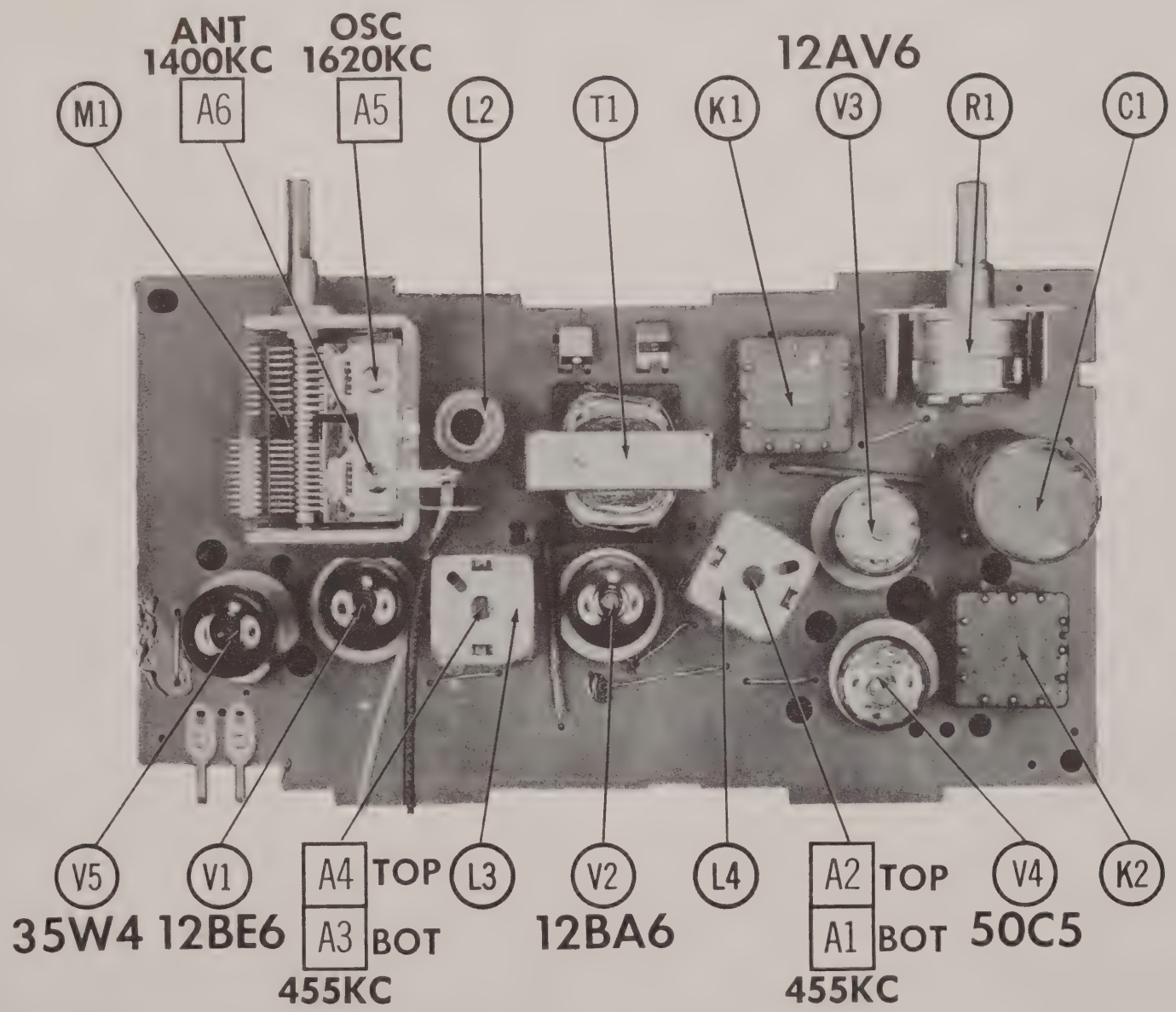


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	Note 1
V4	Output	50C5	
V5	Rectifier	35W4	

Note 1. Some versions may use Type 12AT6.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	925402 ①	PRS150V3050	BBRD5315	TCD497	TDLD-8	MTD-301	TVA-2450
B	30	150							

① Alternate Part #925378 or 925372.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	390448					Volume & Switch

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω	3-4Ω	734138 ① 734192 ② 734193 ③	Z1101 ④	A-3025 ④	A-3332 ④	24S53 ④	S-12X ④	① Used in Model 851B ② Used in Model 852B ③ Used in Model 853B ④ Bend ears down.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	180149 ①	4A07	① Used in Model 851B
	4"	PM		180152 ②		② One used in Model 852B & Two used in Model 853B.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Antenna	700118				Includes Cabinet Back, Model 851B
	Loop Antenna	700119				Includes Cabinet Back, Model 852B
	Loop Antenna	700121				Includes Cabinet Back, Model 853B
L2	Osc. Coil	716108				
L3	Input IF	720259	16-6780	BC-356	13-PC1	
L4	Output IF	720259	16-6780	BC-357	13-PC2	

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EMERSON PART No.	REPLACEMENT DATA
K1	RF Module	47000MMF, 330MMF, 4700MMF, 330MMF, 22K, 120Ω, 2. 2Meg, 8. 2Meg.	750011 ①	
K2	Audio Module	4700MMF, 22000MMF, 47000MMF, 470K, 470K, 150Ω, 1200Ω 1W.	750010	

① Some versions may use Part #750009.

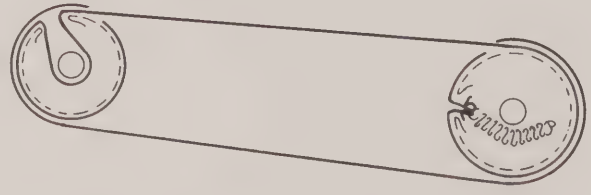
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M1	Tuning Cap	900153	2 Gang, Chassis 120327B
	Tuning Cap	900161	2 Gang, Chassis 120334B
	Tuning Cap	900158	2 Gang, Chassis 120335B

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

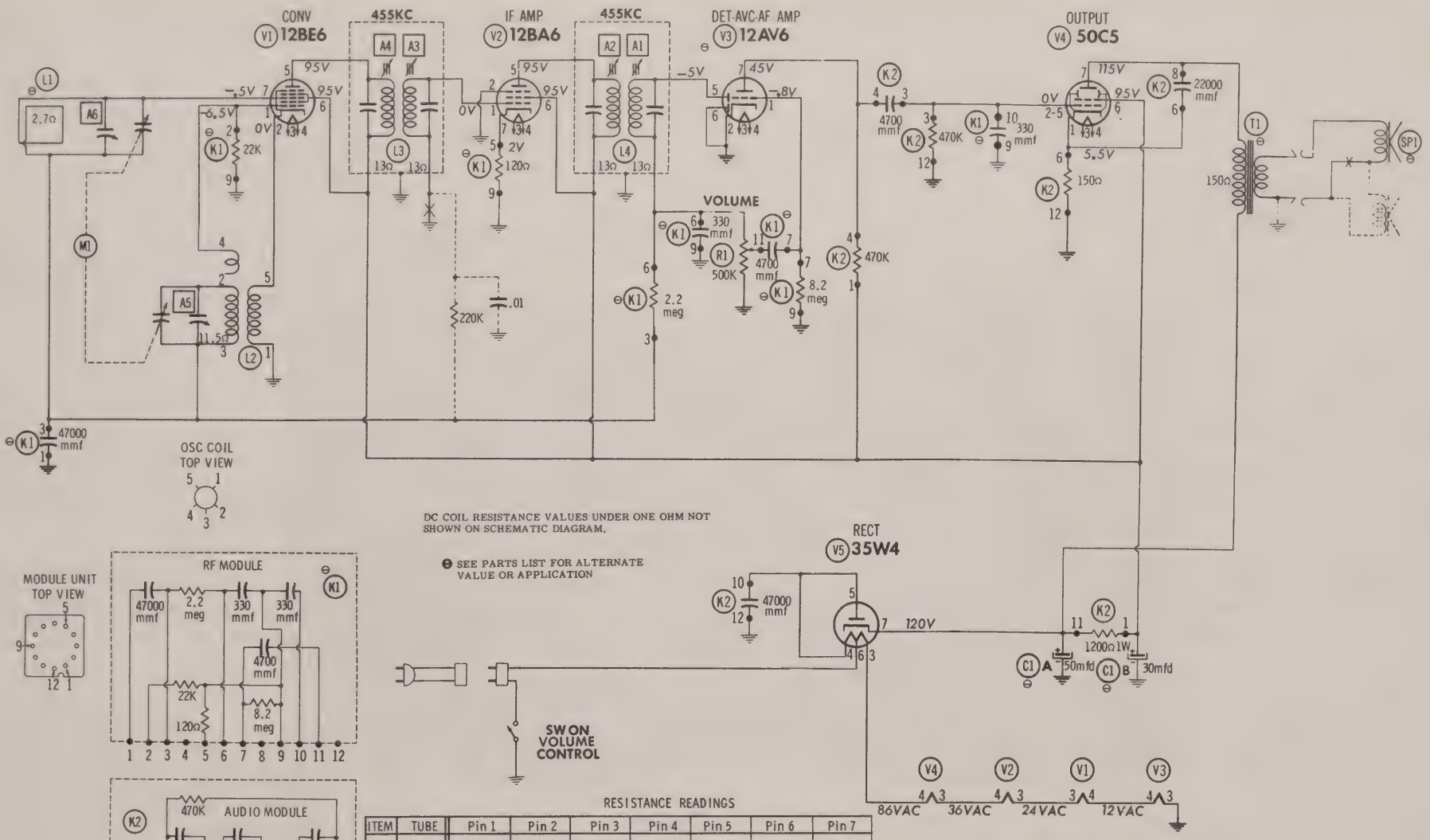
NAME	PART NO.	DESCRIPTION
Cabinet	851B	Model 851B (Specify Color)
Cabinet	852B	Model 852B (Specify Color)
Cabinet	853B	Model 853B (Specify Color)
Knob	460769	Tuning, Model 851B (Specify Color)
Knob	460770	On-Off-Volume, Model 851B (Specify Color)
Knob	460793	On-Off-Volume, Tuning, Model 852B
Knob	460802	On-Off-Volume, Tuning, Model 853B (Specify Color)
Dial	460795	Model 852B
Dial	460798	Model 853B



TUNING GANG FULLY CLOSED

DIAL CORD STRINGING

EMERSON MODEL 851B (Ch. 120327B)



RESISTANCE READINGS

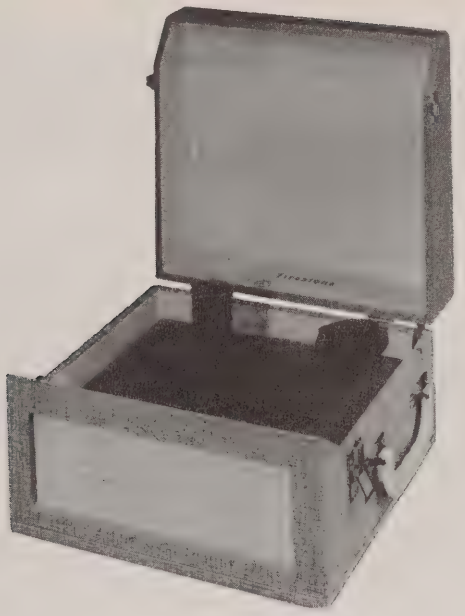
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	24Ω	12Ω	† 1200Ω	† 1200Ω	2.7Meg
V2	12BA6	13Ω	0Ω	24Ω	36Ω	† 1200Ω	† 1200Ω	120Ω
V3	12AV6	8.2Meg	0Ω	0Ω	12Ω	500K	0Ω	† 470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	† 1200Ω	† 150Ω
V5	35W4	NC	NC	86Ω	110Ω	110Ω	105Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

FIRESTONE
MODELS 4-A-150 (Code 364-6-445)



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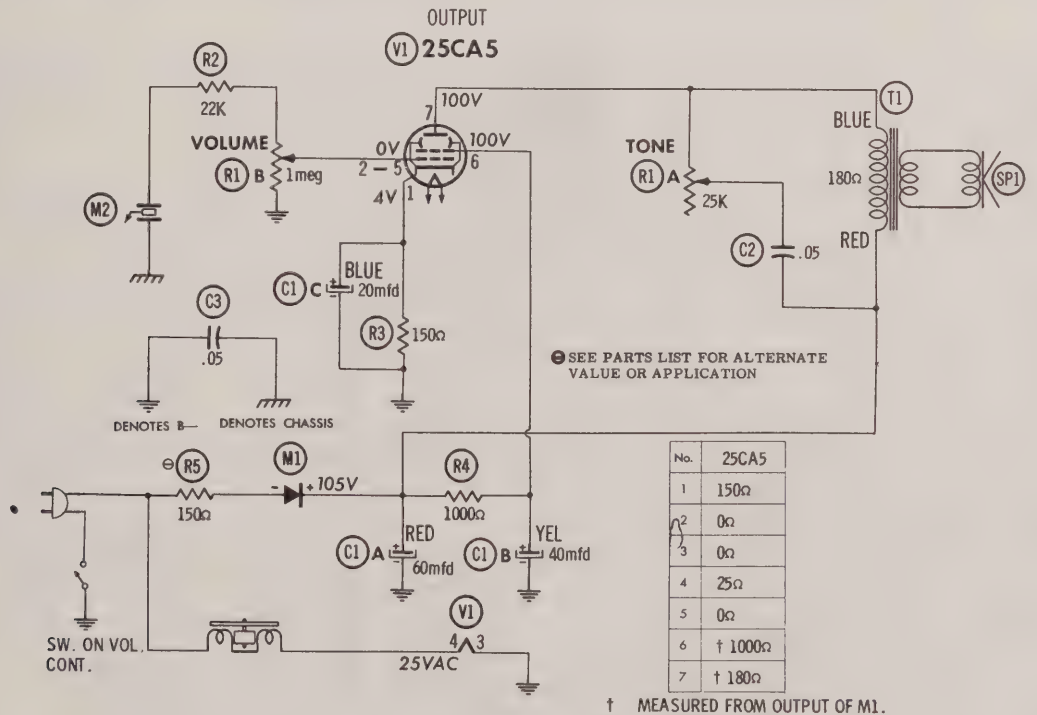
3924 MEADE ST.
DENVER, COLORADO

FIRESTONE
MODELS 4-A-150 (Code 364-6-445)

TRADE NAME	Firestone Model 4-A-150 (Code 364-6-445)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (One)	Type 25CA5 Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .38 Amp. @ 117 Volts AC



No.	25CA5
1	150Ω
2	0Ω
3	0Ω
4	25Ω
5	0Ω
6	† 1000Ω
7	† 180Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

372-5

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25CA5	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FIRESTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	1016	PRS150/25V-5050/20	BBRT5515C	TCT3117	TDLT-18	FMT-333	TVA-3436
B	40	150							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C3	.05	200		BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	25K	1/2	417A	F1-27		♦ QJ-1007R	UF253L	Tone
B	1Meg			R2-52		♦ Not Req.	UR16A	Volume
C	Switch			KB-1		♦ Not Req.	US-26	

♦ Concentrikit Equivalent: K-6 Kit, Base Elements and Shafts; B11-120, P14-019 (Panel) B13-137, R1-028, (Rear) 76-1 Switch.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R2	22K			BTS-22K	
R3	150Ω			BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R4	1000Ω			BTS-1000	
R5	150Ω		633		Note 1

Note 1. Fusible Type.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3500Ω	3-4Ω	Part of Spkr. 2632	Z1101	A-3025	A-3332	26S58	S-12X	

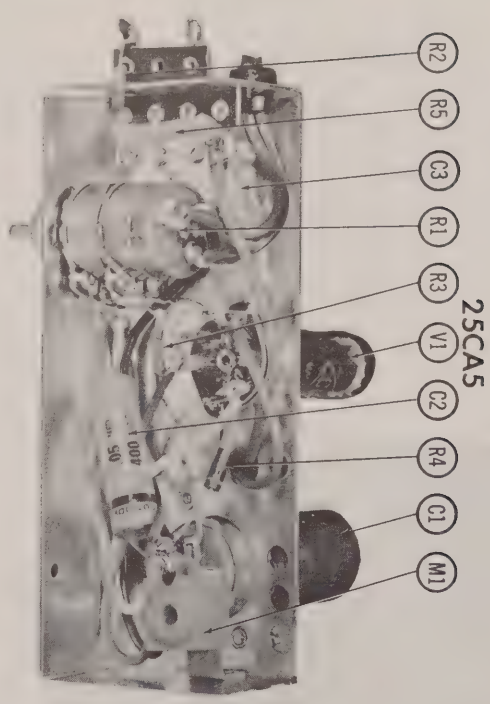
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	2632 ①	4A07	① Includes T1

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	FIRESTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.031A	2743	1386	RS065Q	6S65	65	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	FIRESTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	2573A ♦	62-1	K	51-1	PFT-1	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

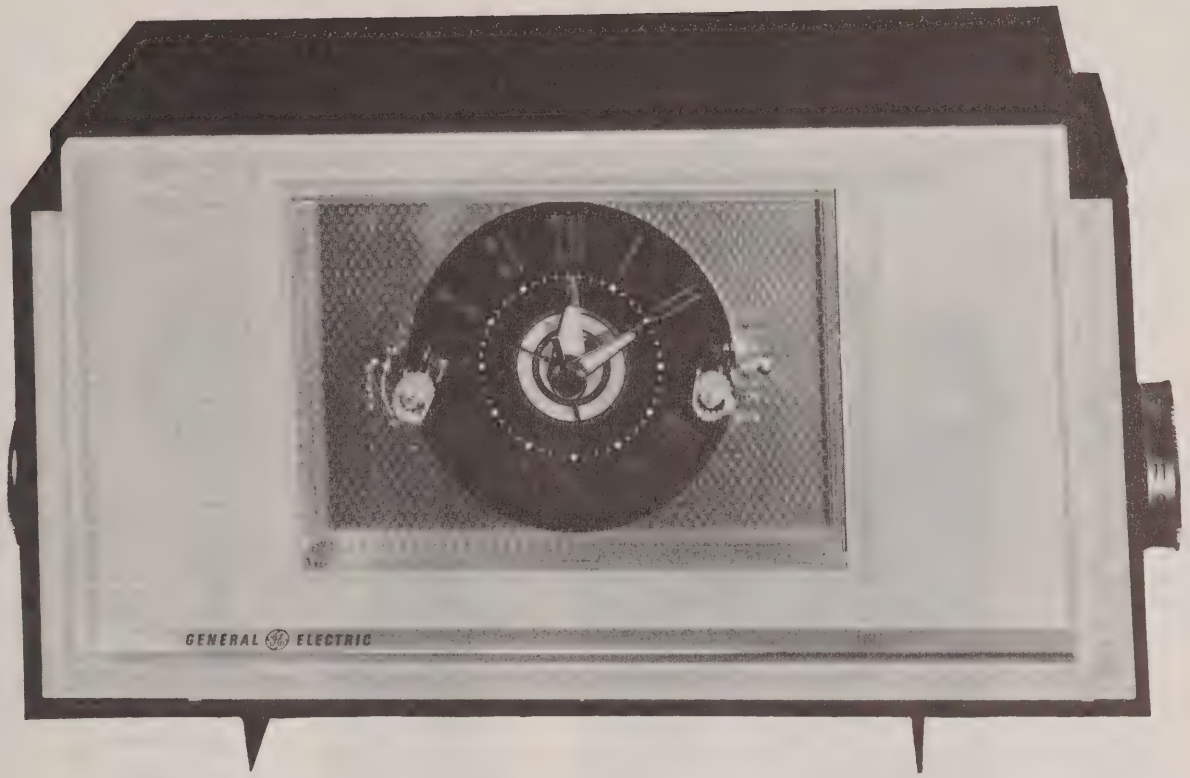
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	FIRESTONE PART No.	JENSEN PART No.	WALCO PART No.	
M3	2549B	* A-76LP or † A-67LP or ♦ A-67LPD	* W-39MGA or † W-39MGS or ♦ W-39MGD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
	Cabinet	2065C	
	Handle	1733B	Includes Loops
	Knob	2429	Volume
	Knob	2429A	Tone

GENERAL ELECTRIC
MODELS 940, 941, 942



GENERAL ELECTRIC
MODELS 940, 941, 942

TRADE NAME	General Electric Models 940, 941, 942
MANUFACTURER	General Electric Co., Products Service, Radio Receiver Dept., 869 Broad St., Utica, N.Y.
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12AU6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles — RATING .28 Amp. @ 117 Volts AC, 28 Watts (Without Clock)
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01 MFD	High side to pin 1 (grid) of 12AU6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC	"	A6	Adjust for maximum output while rocking tuning gang.

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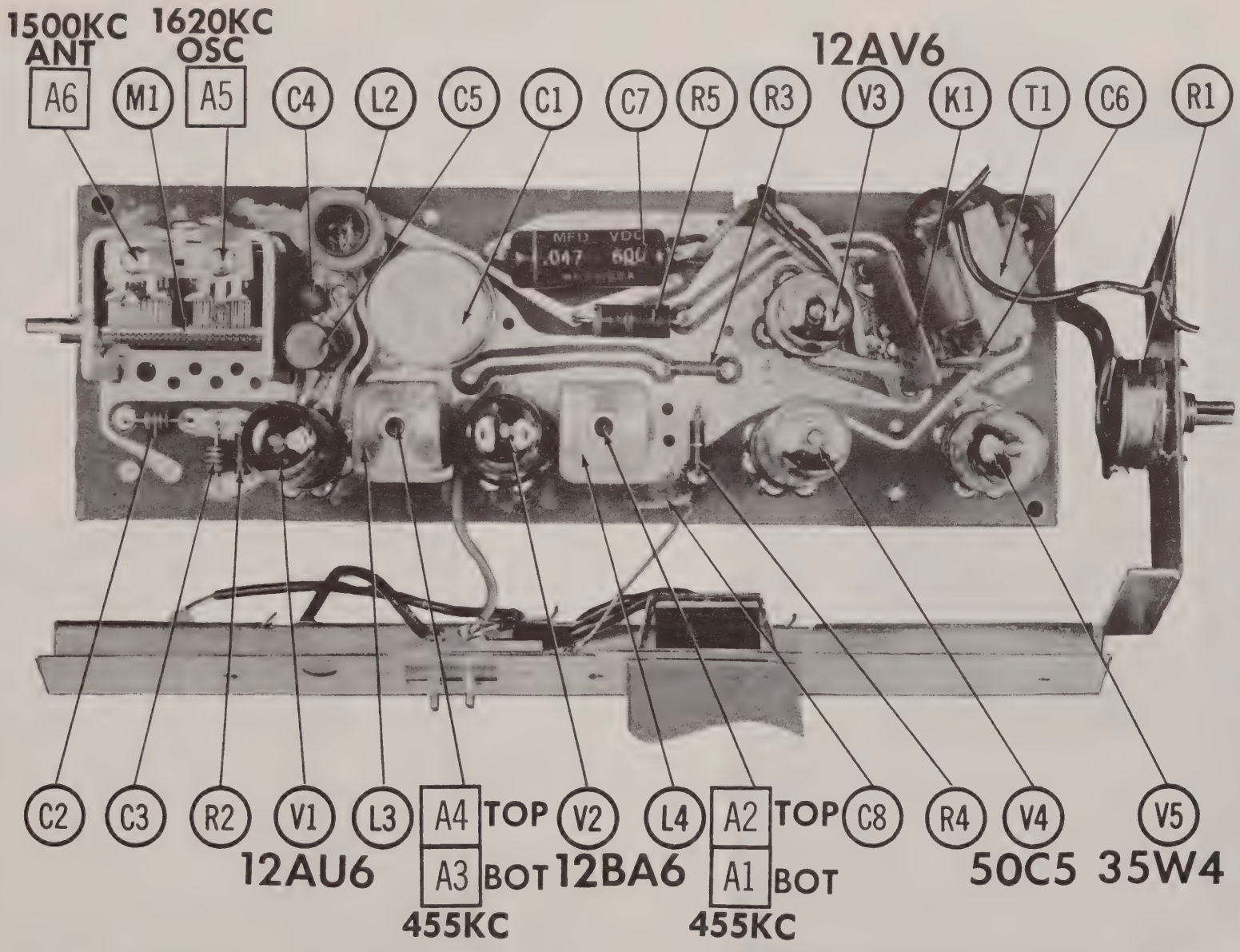


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amplifier	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	General Electric PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 75	150	RCE-231	PRS150V8040	BBRD8415	TCT3115	TDLD-10	MTD-303	
B	▲ 30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	22			SI22	D6-220	LT6Q22	GP-22	UC-5422	5GA-Q22	
C3	22			SI22	D6-220	LT6Q22	GP-22	UC-5422	5GA-Q22	
C4	3.0		RCW-3216	NPO-SI3.0		C10V3C	TCO-3	ZT-553		
C5	.047	400	RCC-125			BC6S47J		ACE6147	4TM-S47	
C6	10000	1000	RCW-3250		DD-103	BYA10S1			5GA-S1	
C7	.047	600	RCN-109	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C8	10000		RCW-3186	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Electric PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	RRC-384	AB-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			AK-7	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R2	2.2Meg			BTS-2.2Meg	
R3	2.2Meg			BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R4	150Ω			BTS-150	
R5	1500Ω	2		BTB-1500	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	General Electric PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	RTO-191	Z1101 ①	A-3025 ①	A-3332 ①	22S58 ②	S-12X ①	① Use Orig. Mtg. Frame ② Bend Ears Down

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	General Electric PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	ROP-033	4A07	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	RLL-064				
L2	Osc. Coil	RLC-142				
L3	Input IF	RTL-197	16-6780	BC-356	13-PC8	
L4	Output IF	RTL-197	16-6780	BC-357	13-PC10	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	General Electric PART No.	REPLACEMENT DATA
K1	Audio Coupling Net.	5000MMF, 220MMF, 2000MMF, 400MMF, 470K, 470K, 6.8Meg	REK-011	

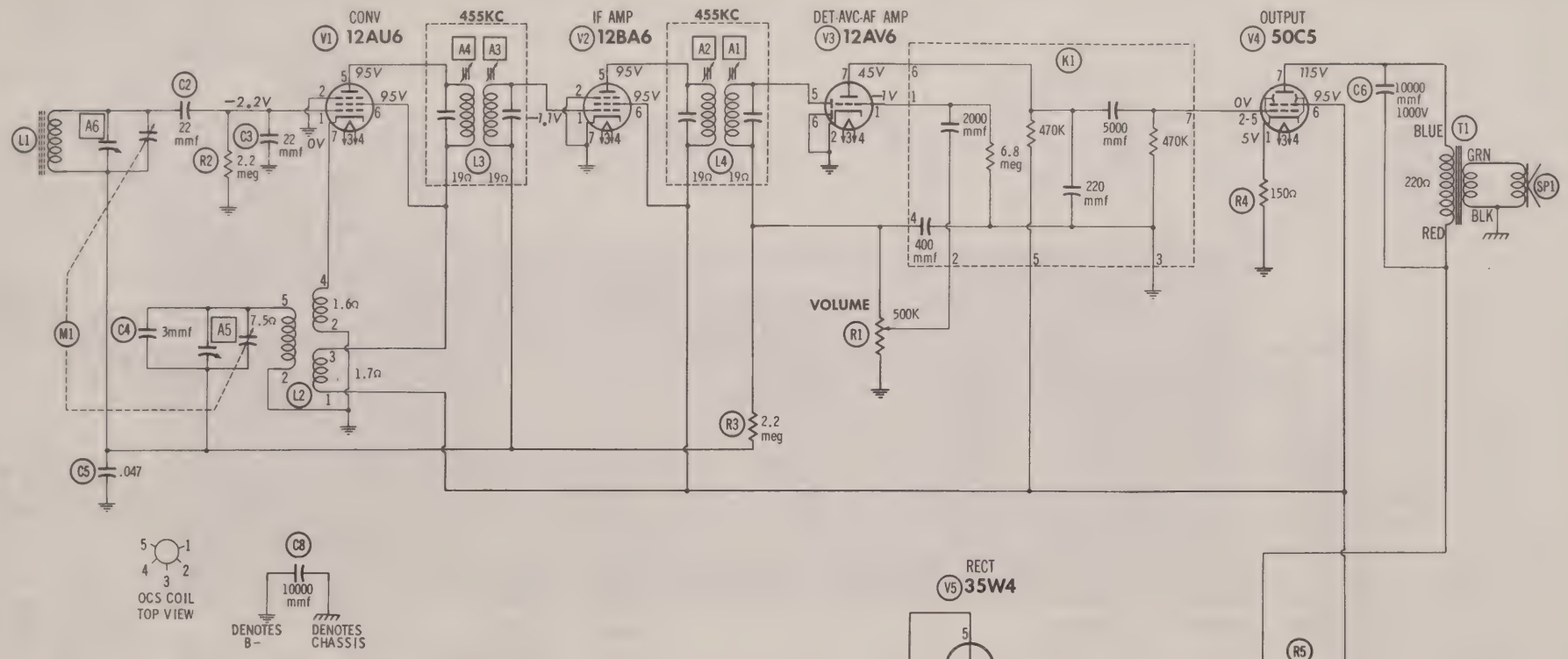
MISCELLANEOUS

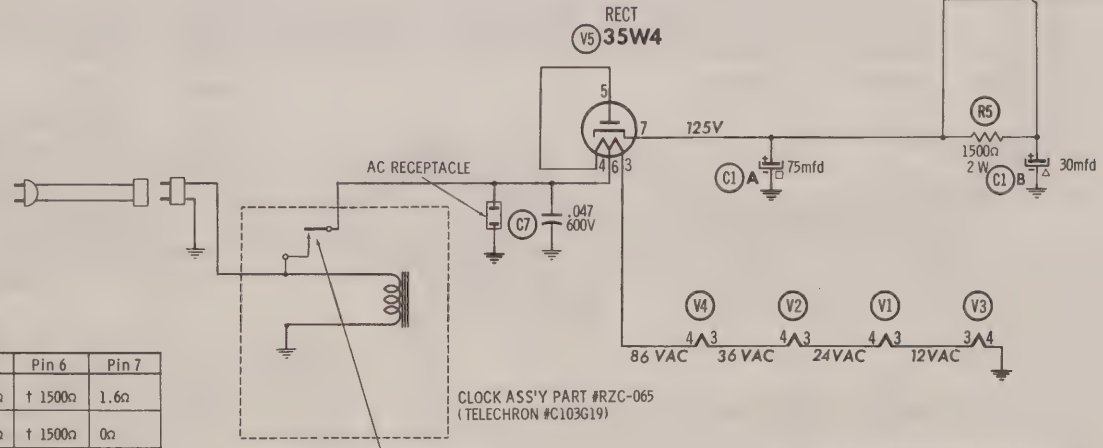
ITEM No.	PART NAME	General Electric PART No.	NOTES
M1	Tuning Cap	RCT-100	2 Gang (Ant. 11-283MMF, Osc. 10-112MMF)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RDK-589	Tuning; Mahogany, gold & black - Model 940
Knob	RDK-591	Tuning; Antique white, gold & black - Model 941
Knob	RDK-593	Tuning; White, gold & black - Model 942
Knob	RDK-590	On-off-volume; Mahogany, gold - Model 940
Knob	RDK-592	On-off-volume; Antique white, gold - Model 941
Knob	RDK-594	On-off-volume; White, gold - Model 942
Knob	RZK-017	Clock
Cabinet Front	RAC-198	Antique white - Models 940, 941
Cabinet Front	RAC-199	White - Model 942
Cabinet Back	RAB-314	Mahogany - Model 940
Cabinet Back	RAB-315	Red - Model 941
Cabinet Back	RAB-316	Tan - Model 942
Clock Assy.	RZC-065	(Telechron #C103G19)





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2.2Meg	0Ω	12Ω	24Ω	† 1500Ω	† 1500Ω	1.6Ω
V2	12BA6	2.7Meg	0Ω	24Ω	36Ω	† 1500Ω	† 1500Ω	0Ω
V3	12AV6	6.8Meg	0Ω	12Ω	0Ω	500K	0Ω	† 470K
V4	50C5	150Ω	470K	36Ω	75Ω	470K	† 1500Ω	† 220Ω
V5	35W4	NC	NC	75Ω	108Ω	108Ω	100Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

Howard W. Sams & Co., Inc. 1957

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MODEL W1121U (Ch. 322U)

PROPERTY OF
F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

HOFFMAN
Chassis 321, U, 322, U

TRADE NAME	HOFFMAN	MODELS	CHASSIS
		B1081, B1091, B1111, B3061, B3101, K1081, M1091, M1111, M3061, M3101, P3101, SP3061, W1111, W3061, W3101	321
		B1081U, B1091U, B1111U, B3061U, B3101U, K1081U, M1091U, M1111U, M3061U, M3101U, P3101U, SP3061U, W1111U, W3061U, W3101U	321U
		B1121, B3071, B3114, M1121, M3071, M3114, P1121, P3071, P3091, P3114, W1121, W3071, W3114	322
		B1121U, B3071U, B3114U, M1121U, M3071U, M3114U, P1121U, P3071U, P3091U, P3114U, W1121U, W3071U, W3114U	322U

MANUFACTURER	Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 185 Watts, 1.5 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13VHF, 14 thru 83UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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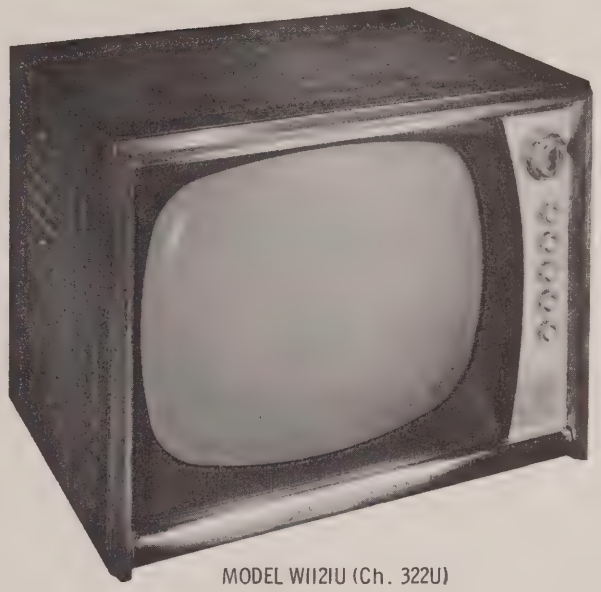
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 push on type control knobs from the front.
2. Remove 7 wood screws and the rear cover.
3. Remove the picture tube socket, HV lead, 2 speaker leads, yoke plug and antenna terminal board leads.
4. Remove 2 chassis bolts from the bottom.
5. Remove 1 wood screw holding the top chassis brace.
6. Remove the chassis.
7. Remove 2 speaker nuts and the speaker.



MODEL W1121U (Ch. 322U)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MODELS	CHASSIS
B1081, B1091, B1111, B3061, B3101, K1081, M1091, M1111, M3061, M3101, P3101, SP3061, W1111, W3061, W3101	321
B1081U, B1091U, B1111U, B3061U, B3101U, K1081U, M1091U, M1111U, M3061U, M3101U, P3101U, SP3061U, W1111U, W3061U, W3101U	321U
B1121, B3071, B3114, M1121, M3071, M3114, P1121, P3071, P3091, P3114, W1121, W3071, W3114	322
B1121U, B3071U, B3114U, M1121U, M3071U, M3114U, P1121U, P3071U, P3091U, P3114U, W1121U, W3071U, W3114U	322U

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws and the metal trim at the top of the safety glass. Tilt glass out at the top and remove.

FOCUS

The focus may be varied by means of a focus control. (For location, see tube placement chart).

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary A3 on top of chassis.

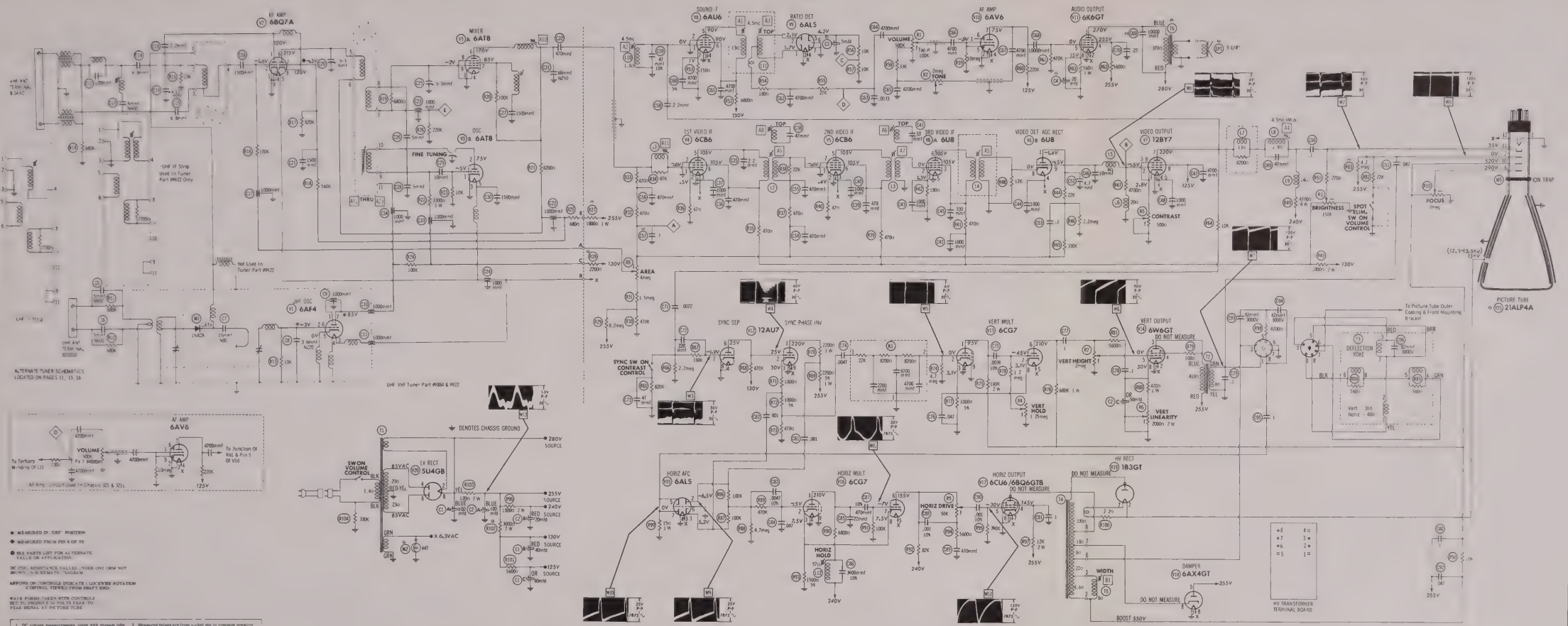
CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOFFMAN
Chassis 321, U, 322, U

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



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TUBE PLACEMENT CHART

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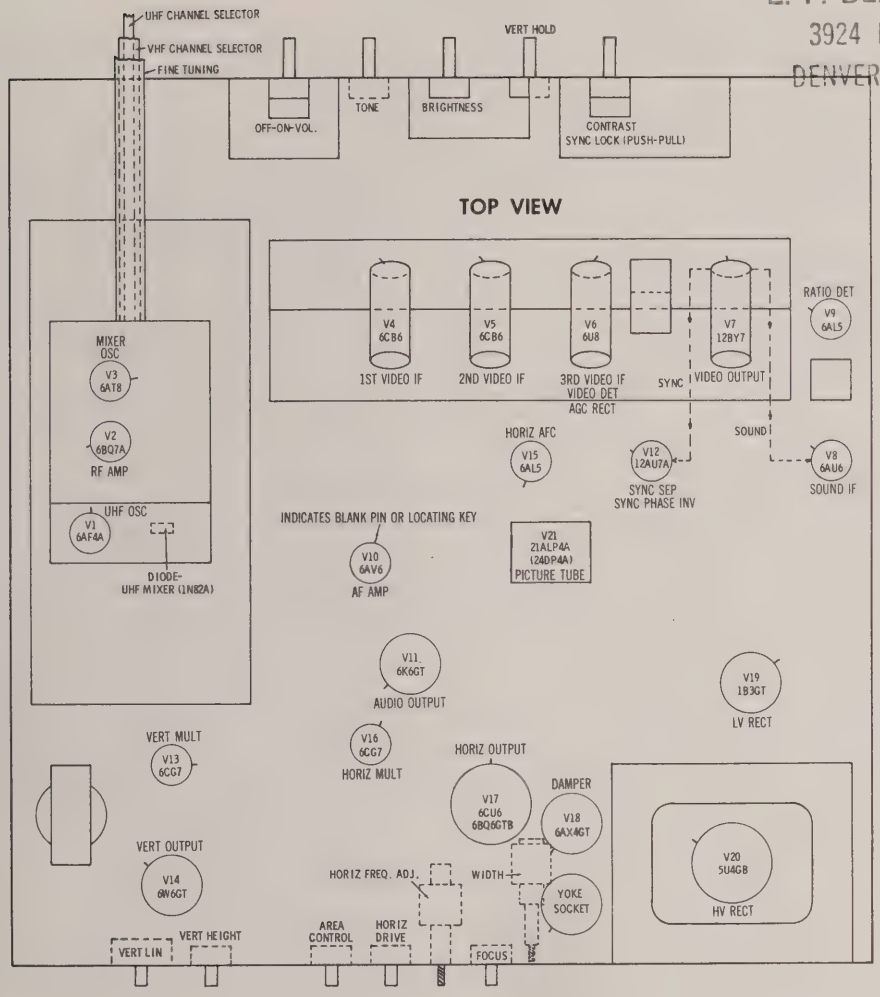

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V20**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V4, V5, V6, V7**
No pic, no sound, has snow - **V2, V3, (V1 UHF Only)**
No pic, has sound, has raster - **V7, V21**
Has pic, no sound - **V8, V9, V10, V11**
Overloaded picture - **V6**

SYNC FAILURE
No vert. sync - **V12**
No horiz. sync - **V12, V15**
No vert. or horiz. sync - **V12**

SWEEP FAILURE
No raster, has sound - **V15, V16, V17, V18, V19, V21**
No vertical deflection - **V13, V14**
Poor vert. linearity or foldover - **V13, V14**
Poor horiz. linearity or foldover - **V16, V17, V18**
Narrow picture - **V16, V17, V18, V20**
Vert. off freq. - **V13, V14**
Horiz. off freq. - **V16**

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CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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HOFFMAN
Chassis 321, U, 322, U

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set the contrast control to maximum.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Do not remove the horizontal oscillator tube (V16) to disable the high voltage.

SOUND IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.005MFD	High side to point Ⓔ. Low side to chassis.	4.5MC (Unmod)	Between Channels	DC probe to point Ⓒ. Common to chassis.	A1, A2	Adjust for maximum deflection. Use only enough generator output to provide a usable indication on VTVM.
2.	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓓ.	A3	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.005MFD	High side to point Ⓔ. Low side to chassis.	4.5MC (Unmod)	Between Channels	DC probe thru detector (Fig. 1) to pin 11 (cathode) of picture tube.	A4	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Connect a .001MFD capacitor across the input terminals of the VTVM and the Oscilloscope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.005MFD	High side to point Ⓔ. Low side to chassis.	Not used	44.0MC (Unmod)	Between Channels	USE VTVM. High side thru 10K to point Ⓑ. Common to chassis.	A5	Adjust for maximum deflection.
5.	"	"	"	47.25MC	"	"	A6	Adjust for MINIMUM deflection.
6.	"	"	"	45.4MC	"	"	A7	Adjust for maximum deflection.
7.	"	"	"	41.25MC	"	"	A8	Adjust for MINIMUM deflection.
8.	"	"	"	43.25MC	"	"	A9	Adjust for maximum deflection.
9.	"	"	"	43.0MC	"	"	A10	Adjust for MINIMUM deflection.
10.	"	"	"	43.0MC	"	"	A11	Adjust for maximum deflection.
11.	"	"	"	45.0MC	"	"	A10	"
12.	"	"	43.5MC (10MC Swp)	42.25MC 45.75MC	"	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.		Check for response curve similar to Fig. 2 with markers as shown. If necessary, SLIGHTLY retouch A5 thru A11 for desired response.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

UHF TUNER AND RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

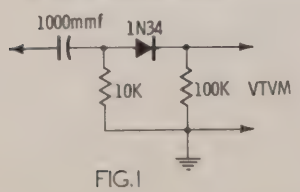


FIG.1

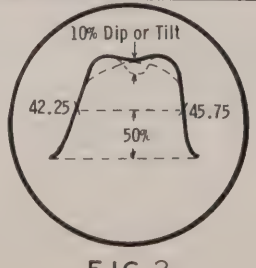


FIG.2

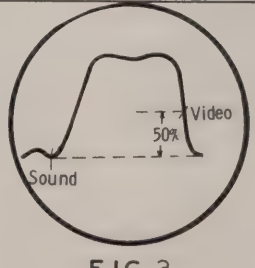
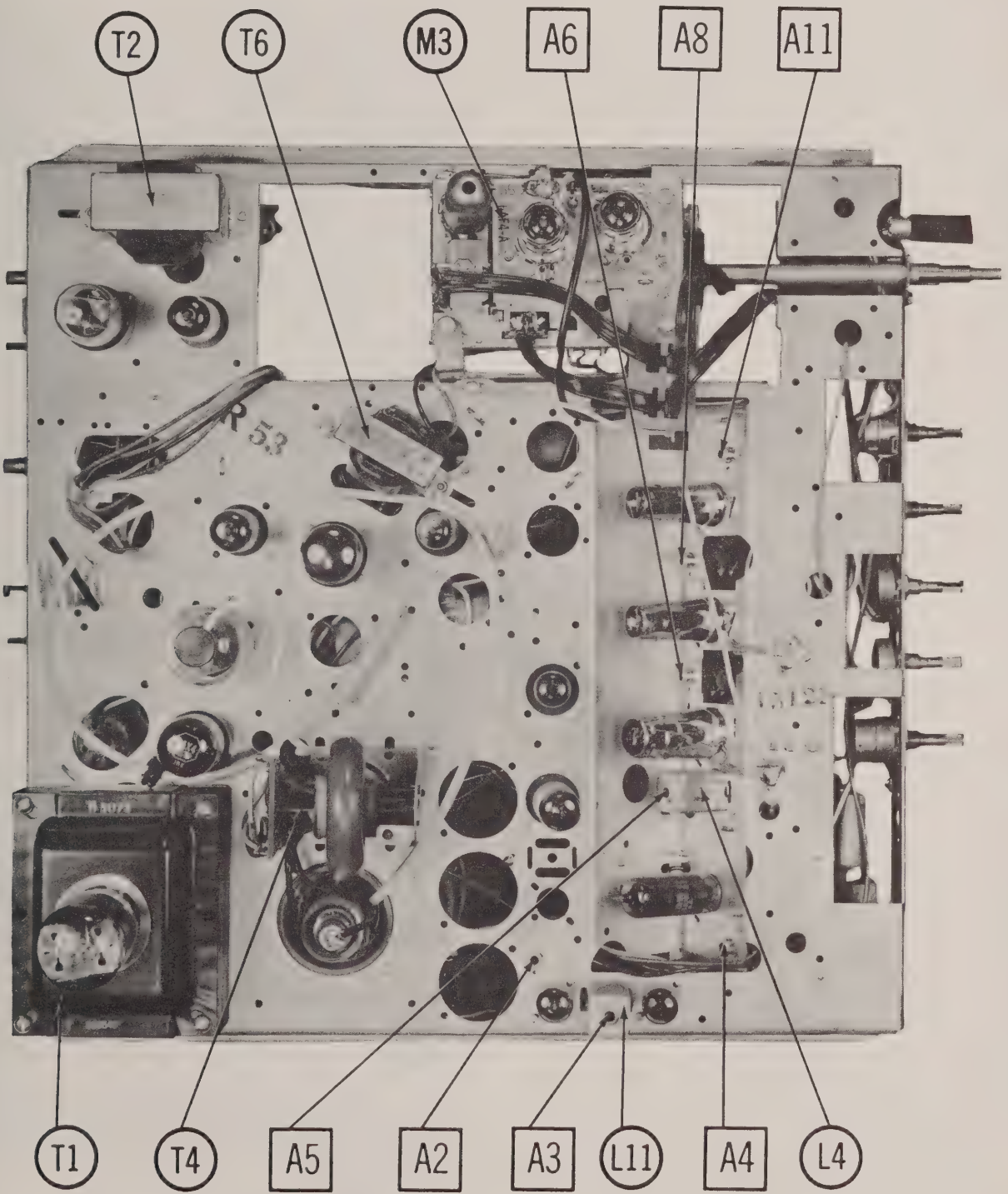


FIG.3

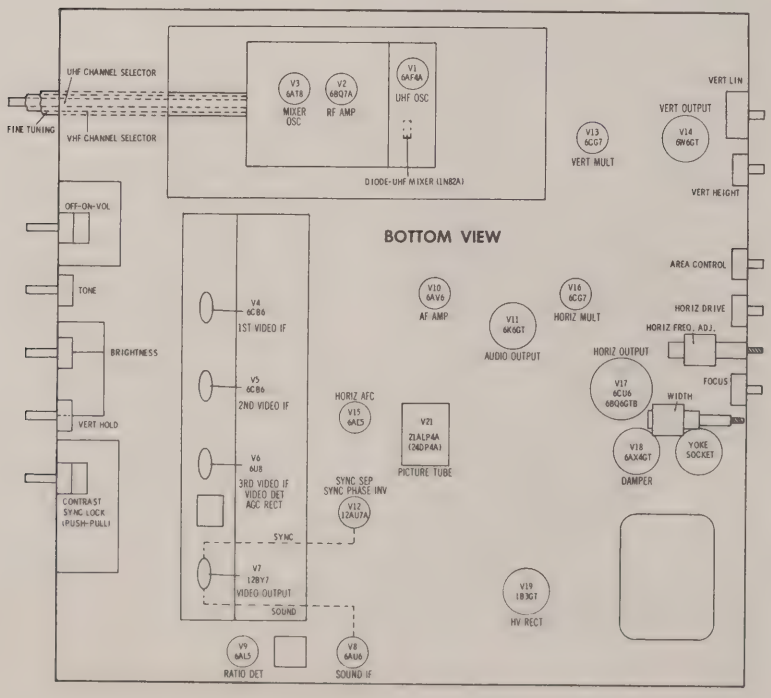


CHASSIS TOP VIEW

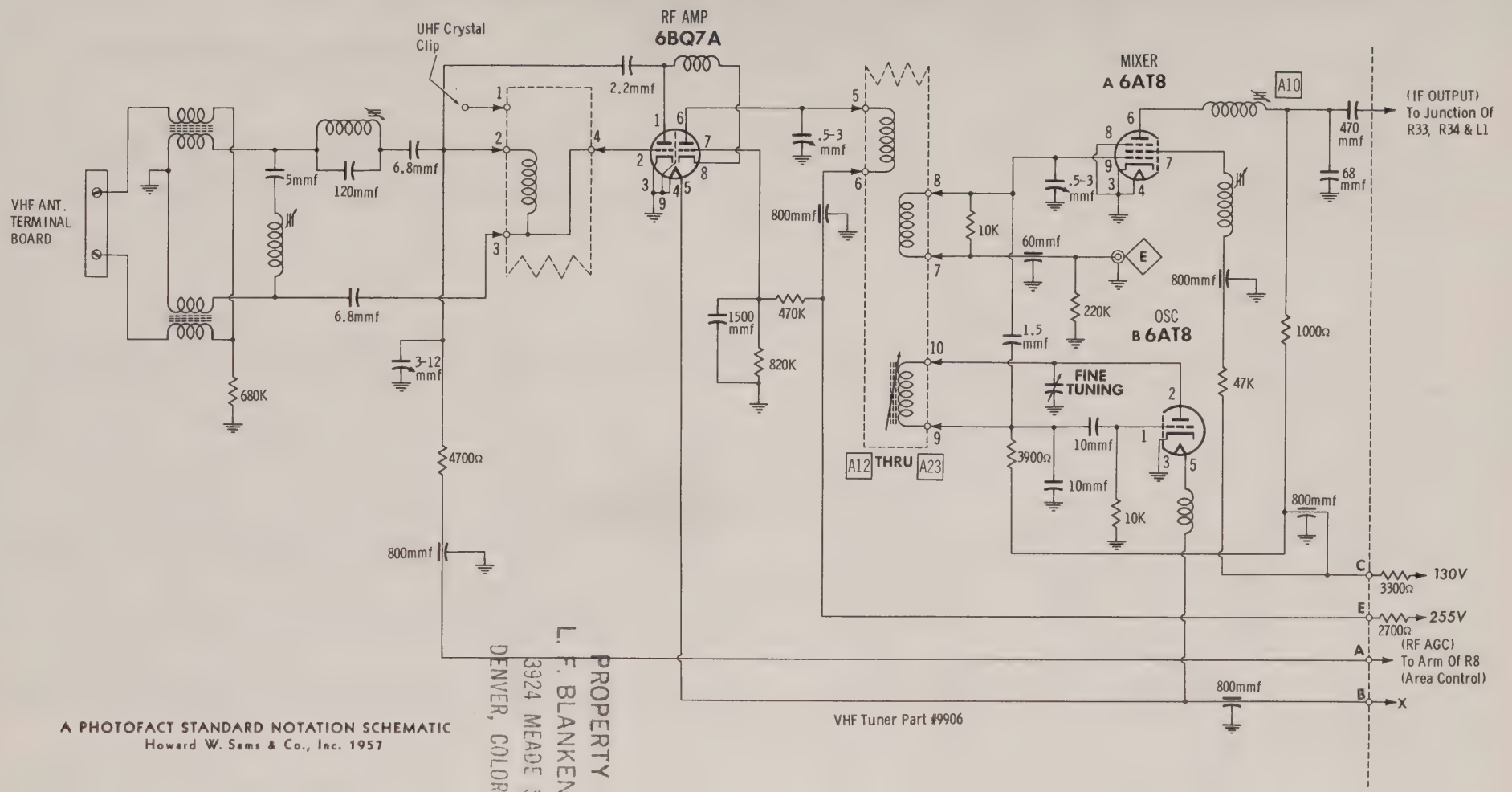
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4	† *8500Ω	*10K	.1Ω	0Ω	*0Ω	*10K	† *8500Ω		
V2	6BQ7A	INF	1.8Meg	0Ω	0Ω	.1Ω	† 2500Ω	330K	INF	0Ω
V3	6AT8	10K	† 8500Ω	0Ω	0Ω	.1Ω	† 12K	† 110K	0Ω	220K
V4	6CB6	1.6Meg	47Ω	.1Ω	0Ω	† 4900Ω	† 4900Ω	0Ω		
V5	6CB6	1.6Meg	47Ω	.1Ω	0Ω	† 4900Ω	† 4900Ω	0Ω		
V6	6U8	1.5Meg	.1Ω	† 4900Ω	.1Ω	0Ω	† 4900Ω	180Ω	.1Ω	4700Ω
V7	12BY7	• 370Ω	4700Ω	• 370Ω	.1Ω	.1Ω	0Ω	† 5800Ω	† 8700Ω	• 370Ω
V8	6AU6	1.4Ω	0Ω	0Ω	.1Ω	† 10K	† 10K	150Ω		
V9	6AL5	INF	INF	0Ω	.1Ω	20K	0Ω	0Ω		
V10	6AV6	10Meg	0Ω	0Ω	.1Ω	10Meg	NC	† 230K		
V11	6K6GT	NC	.1Ω	† 370Ω	† 5700Ω	470K	TP	0Ω	560Ω	
V12	12AU7	† 4500Ω	† 470K	4000Ω	0Ω	0Ω	† 470K	2.5Meg	0Ω	.1Ω
V13	6CG7	‡190K	4.7Meg	1000Ω	0Ω	.1Ω	‡690K	• 1.8Meg	1000Ω	0Ω
V14	6W6GT	NC	.1Ω	† 530Ω	† 630Ω	• 1Meg	NC	0Ω	• 1200Ω	
V15	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	15Ω	0Ω	15Ω		
V16	6CG7	† 8000Ω	5.2Meg	1500Ω	0Ω	.1Ω	† 83K	100K	1500Ω	0Ω
V17	6CU6/ 6BQ6GTB	NC	0Ω	NC	† 12K	390K	TP	.1Ω	0Ω	TOP CAP ‡18Ω
V18	6AX4GT	NC	NC	1Meg	NC	† 120Ω	NC	0Ω	.1Ω	
V19	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡348Ω
V20	5U4GB	NC	30K	NC	20Ω	NC	23Ω	NC	30K	
V21	21ALP4A	0Ω	† 4.7Meg	PIN 6 • ‡500K	PIN 10 ‡10K	PIN 11 • 290K	PIN 12 .1Ω			

* MEASURED IN "UHF" POSITION.
† MEASURED FROM PIN 8 OF V20.
‡ MEASURED FROM PIN 3 OF V18.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
TP TIE POINT
NC NO CONNECTION



TUBE PLACEMENT CHART



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DENVER, COLORADO

ALTERNATE TUNER SCHEMATIC

HOFFMAN
Chassis 321, U, 322, U

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Oscillator	6AF4	
V2	RF Amplifier	6BQ7A	
V3	Mixer-Oscillator	6AT8	
V4	1st Video IF Amp	6CB6	
V5	2nd Video IF Amp	6CB6	
V6	3rd Video IF Amp -Video Det. AGC Rect	6U8	
V7	Video Output	12BY7	
V8	Sound IF Amp	6AU6	
V9	Ratio Detector	6AL5	
V10	AF Amplifier	6AV6	
V11	Audio Output	6KBQT	
V12	Sync Sep -Sync Phase Inverter	12AU7	
V13	Vert. Mult.	6CU7	
V14	Vert. Output	6W6GT	
V15	Horiz AFC	6AL5	
V16	Horiz. Mult	6CG7	
V17	Horiz. Output	6CU6	
V18		6HQ6GTB	
V19	Damper	6AX4GT	
V20	HV Rectifier	1B3GT	
V21	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA			NOTES
	HOFFMAN PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V31	21ALP4A	21ALP4A/	21ALP4A/ ① Aluminized	
	21ALP4A ‡	21ALP4B ‡	② Silver screen "85"	
	21ALP4			
	24DP4A ‡	24DP4A ‡		
	24DP4	24DP4		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP	VOLT	HOFFMAN PART No.	ALLOY PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	100	350	4338A	PRS-135		FP347		Q-221.5	R3189 *
B	40	350				TC56			
C	40	350							
C3A	100	350	4339A	PRS-063		FP355		T-110	R3168 *
B	30	350				TC59		MT-3550	
C	30	50							
C3	5	50	4354A (Note 1)	PRS30V5	BSRS-50	TC30	TD-5-50	MT-1504	TVA-1305
C4	30	50	4353A (Note 1)	PRS30V30	BSR30-150	TC48	TD-30-150	MT-1530	TVA-1420

Note 1. Chassis 32 and 32U use Part #4352A.
Note 2. Chassis 32i and 32iU use a 33MFD ① 50V (Part #4353J) in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	HOFFMAN PART No.	ALLOY PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5										N900
C6	8									
C7	15									N90
C8	2.6									N120
C9	1000		EF-001	MFT-1000					502C-DL	
C10	1000		EF-001	MFT-1000					502C-DL	
C11	1000		EF-001	MFT-1000					502C-DL	
C13	150		RDD-0002	DD-150	L10T13	ED-150	UC-5812	SCA-T13		
C14	6.8		MPG-81 6 8	TCZ-6S8	C10V68C	TCD-6.8	ZT-5868	57CCD-V68		
C15	6.8		MPG-81 6 8	TCZ-6S8	C10V68C	TCD-6.8	ZT-5868	57CCD-V68		
C16	1500		RDD-0015	DD-152	BY A10D15	ED-0015	DCS215	518K-DS		
C17	1000		EF-001	MFT-1000				502C-DL		
C18	3 3		MPG-81 3 3	TCZ-3R3	C10V33C	TCD-3 3		57CCD-W33		
C19	3-12									
C20	3-3			839-3		3U18-E	CT56BA			
C21	1500		RDD-0015	DD-152	BY A10D15	ED-0015	DCS215	518K-DS		
C23	1000		EF-001	MFT-1000					502C-DL	
C24	1000		EF-001	MFT-1000					502C-DL	
C25	1000		EF-001	MFT-1000					502C-DL	
C26	5-8			839-8		3U18-E	CT56BA			
C27	3 3			TCD-3 3		TCD-3 3				
C31	1500		RDD-0015	DD-152	BY A10D15	ED-0015	DCS215	518K-DS		
C33	3		RPD-000006	DD-030	L10Y3	ED-3	ST-554	SCA-Y3		
C39	10		RPD-0001	DD-100	L10Q	ED-10	UC-541	SCA-Q		
C30	1500		RDD-0015	DD-152	BY A10D15	ED-0015	DCS215	518K-DS		
C31	6.8		M750-81 68	TCZ-6S8	C10V68U	TCD-6.8	ZT-5868	57CCU-Q68	N750	
C32	470		RPD-0047	DD-471	BY A10T47	ED-470	SCA-T47	SCA-T47		
C34	1000		EF-001	MFT-1000				502C-DL		
C34	1000		EF-001	MFT-1000				502C-DL		
C35	2 3	6089	MPG-81 2 3	TCZ-2R3	CTA8V23C	TCD-2 3		57CCD-V23		
C36	470	14009	RPD-0047	DD-471	BY A10T47	ED-470	UC-5247	SCA-T47		
C37	470	14045	RPD-0047	DD-471	BY A10T47	ED-470	UC-5247	SCA-T47		
C38	47		RPD-0000047	DD-470	L10Q47	ED-47	UC-5447	SCA-Q47		
C39	470	14009	RPD-0047	DD-471	BY A10T47	ED-470	UC-5247	SCA-T47		
C40	470	14045	RPD-0047	DD-471	BY A10T47	ED-470	UC-5247	SCA-T47		
C41	33		RPD-000033	DD-330	L10Q33	ED-33	UC-5433	SCA-Q33		
C42	1000	14045	RPD-001	DD-102	BY A8D1	ED-1000	DCS1	518K-DI		
C43	1000	14045	RPD-001	DD-102	BY A8D1	ED-1000	DCS1	518K-DI		
C44	1000	14045	RPD-001	DD-102	BY A8D1	ED-1000	DCS1	518K-DI		
C45	330	6010	RPD-00033	DD-331	L10T33	ED-330	UC-5333	SCA-T33		
C46	10	14054	S110	DE-100	L10Q	ED-10	UC-541	SCA-Q		
C47	4700	6035	RPD-0047	DD-472	BY A10D47	ED-0047	UC-5247	SCA-D47		
C48	1000	14045	RPD-001	DD-102	BY A8D1	ED-1000	UC-52	518K-DI		
C49	47	6007	RPD-000047	DD-470	L10Q47	ED-47	UC-5447	SCA-Q47		
C50	.1	400 6150	P488N-1	DP-104	CUB42U		GEM-401	47M-P1		
C51	.047	400 6007	RPD-08	DP-473	CUB39U		GEM-4247	47M-647		
C52	4.7	6088	RPC-8S 4.7	TCZ-4R7	CTA8V47C	TCD-4.7	ZT-5847	57CCD-V47		
C53	.1	300 6043	P488N-1	DP-104	CUB39U		GEM-401	47M-P1		
C54	470	14009	RPD-0047	DD-471	BY A10T47	ED-470	UC-5247	SCA-T47		
C55	470	14009	RPD-0047	DD-471	BY A10T47	ED-470	UC-5247	SCA-T47		
C56	470	14009	RPD-0047	DD-471	BY A10T47	ED-470	UC-5247	SCA-T47		
C57		200	P488N-1	DP-104	CUB42U		GEM-401	47M-P1		Note 2
C58	2 3	6089	MPG-81 2 3	TCZ-2R3	CTA8V23C	TCD-2 3		57CCD-V23		Note 2
C59	47	6007	1459-000047	TCZ-47	22R547	TCC-47		MS-447		10%
C60	4700	6035	1454-0047		1R3D47			MS-247		5%
C61	4700	6035	RPD-0047	DD-472	BY A10D47	ED-0047	UC-5247	SCA-D47		
C62	4700	6035	RPD-0047	DD-472	BY A10D47	ED-0047	UC-5247	SCA-D47		
C63	3300	300 6088	RPD-0033	DE-332	CUB6U33	ED-3300	GEM-6333	57M-D33		
C64	4700	6035	RPD-0047	DD-472	BY A10D47	ED-0047	UC-5247	SCA-D47		
C65	4700	6035	RPD-0047	DD-472	BY A10D47	ED-0047	UC-5247	SCA-D47		
C66	4700	6035	RPD-0047	DD-472	BY A10D47	ED-0047	UC-5247	SCA-D47		
C67	4700	6035	RPD-0047	DD-472	BY A10D47	ED-0047	UC-5247	SCA-D47		
C68	10000	6087	RPD-01	DD-103	BY A8D1	ED-01	DCS1	518K-DI		
C69	10000	6087	RPD-01	DD-103	BY A8D1	ED-01	DCS1	518K-DI		Note 1
C70	.33	600 14103	P488N-33		CUB42U		GEM-4322	47M-P322		
C71	.0022	300 6180	RPD-0022	DE-223	CUB6U22	ED-2200	GEM-6322	57M-D22		

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	HOFFMAN PART No.	ALLOY PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C72	330		6084	RPD-00033	DD-331	L10T33	ED-330	UC-5333	SCA-T33	
C73	47		6007	RPD-000047	DD-470	L10Q47	ED-47	UC-5447	SCA-Q47	
C74	.0047	300	6137	RPD-0047	DE-472	CUB42U47	ED-4700	GEM-6347	57M-D47	
C75	.0039	600	6184	1454-0039		1R3D39			MS-239	10%
C76	.047	300	6147	RPD-05	DE-503	CUB3E47		GEM-4147	57M-647	
C77	.1	600	6138	P488N-1	DP-104	CUB42U		GEM-401	47M-P1	
C78	.1	600	6138	P488N-1	DP-104	CUB42U		GEM-401	47M-P1	
C79	.1	600	611	P488N-1	DP-104	CUB42U		GEM-401	47M-P1	
C80	.1	600	6144	P488N-1	DP-104	CUB42U		GEM-401	47M-P1	
C81	.001	300	6115	RPD-001	DD-103	CUB2E	ED-1000	GEM-432	57M-D	
C82	.001	300	6115	RPD-001	DD-103	CUB2E	ED-1000	GEM-432	57M-D	
C83	.0047	300		1464-0047		1R5D47	C73DC472K	MS-247	57M-D47	10%
C84	.047	300	6147	RPD-05	DE-503	CUB3E47		GEM-4147	57M-647	
C85	33		6033	RPD-05	DE-330	L7T33	ED-33	UC-5433	SCA-T33	
C86	2200		6057	1464-0089		1R5D89		MS-289		10%
C87	470		6009	1464-00047	DS-471	1R5T47	ED-470	MS-247		10%
C88	.001	600		1464-001		1R5D1	ED-1000	MCB255	MS-31	10%
C89	470		14009	1467-00047	DS-471	1WS747	ED-470	UC-5247	57M-D47	
C90	.001	600	6175	1464-001		1R5D1	ED-1000	MCB255	MS-31	10%
C91	.1	400	6150	P488N-1	DP-104	CUB42U		GEM-401	47M-P1	
C92	.047	600	6153	RPD-05	DF-503	CUB5E47		GEM-6147	57M-647	
C93	83	3000	14609		DDS0-930					
C94	83	3000	14609		DDS0-930					
C95	.1	600	6138	P488N-1	DP-104	CUB42U		GEM-601	47M-P1	
C96	82	3000	14609		DDS0-820					

Note 1. Chassis 32 and 32U use an .018MFD ① 600V (Part #1423) in this application.
Note 2. Some versions may use a .22MFD ① 300V (Part #6431) in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HOFFMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	6875A ①	BT-56	A4T2-500K		UT-437	Volume - Trap ② 100K - Note 1
B	Shaft			Not Req.	ES2-3	Not Req.	UM-21	
C	Switch			ES-3	SWS-30	Not Req.	UM-21	AC On-Off & Spot Eliminator Tone
R2A	25meg	½	6878A	B-75	A4T-25meg-S	Q1-159	U54	
B	Shaft			Not Req.	ES2-3	Not Req.	U43	Brightness
R3A	150K	½	6879A	AB-43	A4T-150K-S	Q1-158	U43	
B	Shaft			AK-4	ES2-3	Not Req.		Vert. Hold
R4A	1.25meg	½	6877A	B-69	A4T-1Meg-S	Q1-157	U54	
B	Shaft			Not Req.	ES2-3	Not Req.		Contrast
R5A	500Ω	½	6880A					Sync
B	Switch							Vert. Linearity - Wire wound
R8A	2000K	2	6837A	WH-302	A42-2000	WW2000	R2500L	
B	Shaft			Not Req.	FK2-1/4	Not Req.	Not Req.	Vert. Height
R7A	5Meg	½	6905	E2-75	A4T-5Meg-S	Q1-151	TA56L	
B	Shaft			Not Req.	FK2-1/4	Not Req.	Not Req.	
R8A	4Meg	½	6970	AB-68	A4T-4Meg-S	Q1-146	TA56L	Area (AGC)
B	Shaft			AK-1	FK2-1/4	Not Req.	Not Req.	
R9A	50K	½	6864	BX-51	A4T-50K-S	Q1-132	TA54U	Horiz. Drive
B	Shaft			Not Req.	FK2-1/4	Not Req.	Not Req.	
R10A	2Meg	½	6866	BX-75	A4T-2Meg-S	Q1-139	TA56L	Focus
B	Shaft			Not Req.	FK2-1/4	Not Req.	Not Req.	

Note 1. Chassis 32i and 32iU use part #4580A in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	HOFFMAN PART No.	IRC PART No.	
R11	680K		RTB-680K		
R12	680K		RTB-680K		
R13	10K		RTB-10K		
R14	560K		RTB-560K		
R15	10K		RTB-10K		
R16	100K		RTB-100K		
R17	680K		RTB-680K		
R18	560K		RTB-560K		
R19	68000		RTB-68000		
R20	100K		RTB-100K		
R21	8200Ω		RTB-8200		
R22	3300Ω	1	RTB-3300		
R23	10K		RTB-10K		
R24	100K		RTB-100K		
R25	680		RTB-680		
R26	330K		RTB-330K		
R27	1800Ω	1	BT A-1800	BTA-1800	Note 1
R28	3200Ω		BT A-3200	BTA-3200	Note 3
R29	8.2Meg		6859	BTS-8.2Meg	
R30	470K		6833	BTS-470K	
R31	1Meg		6805	BTS-1.5Meg	
R32	470Ω		6838		
R33	470Ω		6838		
R34	47K		6869		
R35	470Ω		6838		
R36	47Ω		6839	BTS-47	
R37	470Ω		6838		
R38	22K		6838	BTS-22K	
R39	470Ω		6838		
R40	47Ω		6839	BTS-47	
R41	470Ω		6838	BTS-470	
R42	1800		14618	BTS-180	
R43	10000Ω	2	14696	BTB-1000	
R44	33K		6833		
R45	330K		14631	BTS-330K	
R46	3.25Meg		6809		
R47	4700Ω		6878	BTS-4700	
R48	12K		6845	BTS-12K	
R49	4700Ω	4	6862		
R50	10K		6397	BTS-10K	
R51	270K		6903	BTS-270K	
R52	6800Ω		6557	BTS-6800	
R53	180Ω		6616	BTS-180	
R54	180Ω		14618	BTS-180	
R55	27K		14618	BTS-27K	
R56	10K		6897	BTS-10K	
R57	10K		6897	BTS-10K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	HOFFMAN PART No.	IRC PART No.	
R58	33K		6546	BTS-33K	
R59	10Meg		6955	BTS-10Meg	
R60	220K		6818	BTS-220K	
R61	470K		6822	BTS-470K	
R62	5600Ω		6839	BTS-5600	
R63	560Ω	1	6821	BTA-560	
R64	10K		6897	BTS-10K	
R65	820K		6876	BTS-820K	
R66	6800Ω		6858	BTS-2.5Meg	
R67	330K		14631	BTS-330K	
R68	470K		6822	BTS-470K	
R69	2200Ω	5%	24526	BTA-2200 5%	
R70	3300Ω	1	6838	BTA-3300	
R71	1800Ω		6840	BTS-1800	
R72	1800Ω	5%	24517	BTS-1800 5%	
R73	470Ω		6838	BTS-470	
R74	4.7Meg		24859	BTS-4.7Meg	
R75	1.8MΩ	2	24509	BTS-1.8MΩ	
R76	680K	1	24571	BTA-680K	
R77	10000	5%	14690	BTS-1000 5%	
R78	1.5Meg		24549	BTS-1.5Meg	
R79	100Ω		6566	BTS-100	
R80	470Ω	1	6831	BTA-470	
R81	56000		6829	BTS-5600	
R82	33K		6833	BTS-33K	
R83	4.7Meg		24859	BTS-4.7Meg	Note 3
R84	560Ω		6831	BTS-560	
R85	560Ω			BTS-560	
R86	100K		6571	BTS-100K	
R87	100K		6571	BTS-100K	
R88	4.7Meg		24859		
R89	470K		6822	BTS-470K	
R90	6800Ω		6887		
R91	100K		6571	BTS-100K	
R92	82K		24670	BTS-82K	
R93	15000Ω	5%	6810	BTS-3900 5%	
R94	5600Ω		6829		
R95	330K		6833	BTS-330K	
R96	10000		14666	BTS-10K	
R97	12K	2	24592	BTS-12K	
R98	470K		6576	BTS-470K	
R99	15Ω	1	14506	BTA-15	
R100	3.3Ω		4735	BW1-3.3	
R101	5600Ω		6839	BTS-5600	
R102	30000Ω	T	4717A	PW7-3000	
R103	120Ω	T	4719A		
R104	330K		24531	BTS-330K	Note 4

Note 1. A 270Ω, 1W used with Tuner #9906.
Note 2. A 1200Ω used with Tuner #9907 and a 3.3K used with Tuner #9906.
Note 3 Not used in Chassis 32i and 32iU.
Note 4. A 2000, wire wound, used in Chassis 32i and 32iU.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	370VCT	5V	5073		P-1637 ①		26R99 ①	
	47-63 A	@ 270 A	@ 2A						

① Parallel and phase 6.3V filament windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	Vert. Output	S185A	Z1900①	A-3533 ②		V307 ②	A-3543 ②	26S72 ②	A-102X ②
T5	Yoke-Horiz. (30MIN) (90°) Vert. (45MH)	99HD	DF507① ④ ⑤	MDF-82 ③	225G① ⑤	Y907① ④ ⑤	DY-15A ④ ⑤	Y-16 ③ ⑤	Y-14 & WW4 ③ ⑤
M5	Rear Cover and Centering Device	10038							
T4	Horiz. Output	S158A	FB419 * 6	HVO-36 * 1	2257① * 8	X094 * 8	HO-255 * 8	FLY-16 * 8	D-95 * 3
T9	Width Coil	9484	RF800 ③	MWC-1	212R1	20IR16	WC-5 ⑤ ⑥	WC-18	WLC-8

① Use 8 to 1 turns ratio.
② Drill new mounting hole(s) across terminals #2 and #7
③ Use original horizontal network if necessary. ⑤ Use original rear cover and centering device. ⑥ Use red and blue terminals
4. Connect horizontal damping capacitor (C94) 6 Enlarges mounting hole
7 Use terminals #2 and #3
* This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA						NOTES
	PRI.	SEC	HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T8	7800Ω	3-4Ω	S187A①	Z2000	A-3201	A-3848	20S48	S-92	① Used in Ch. 32i, U
	T500Ω	3-4Ω	S160A ②	Z1115	A-3231	A-3570	24S03	S-7X	② Used in Ch. 32, U

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HOFFMAN PART No.	QUAM PART No.	
SP1	8 1/4"	PM	3-4Ω	90W ①	52Al	① Used in Models M111, U; M111i, U; W111, U, M112, U; W112i, U; M113, U; P112, U
	4"	PM	3-4Ω	91T ①	4A07	② Used in Models M205, U, M206, U, M106, U, M106i, U
	6"x11"	PM	3-4Ω	9079 ②		③ Used in Models M307, U, W307, U; B307, U; P307, U, P306, U
	10"	PM	3-4Ω	9103 ③	10A31	④ Used in Models M308, U, W308, U, W306, U; EP308, U, M314, U; W314, U; P314, U
	12"	PM		9130 ④		⑤ Used in Models M310, U; B310, U, W310, U; P310, U

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st. Video IF	5219A	17-4534	TV-131	6226	
L3	2nd. Video IF	5334A	17-4535		6231	Includes 4i 33MC Trap
L5	3rd. Video IF	5337A	17-4538		6232	Includes 4T 33MC Trap
L6	4th Video IF	5254A	17-3004	TV-128	6234	
L8	Series Peaking Coil	5283A	19-3200	TV-121	6156	100 Microhenries
L8	Shunt Peaking Coil	5307A			6156	820 Microhenries
L7	Series Peaking Coil	5281A	19-4400 *		6234 *	190 Microhenries, wound on 8200Ω resistor
L6	4.5MC Trap	5331A	30-1004	TV-181	1469	
L9	Shunt Peaking Coil	5285A	19-3500		6158	470 Microhenries
L10	Sound IF	5321A	30-1004	TV-181	1469	
L11	Ratio Det.	5315A	17-3497	TV-151	6205	Tertiary winding- SG

* Parallel with 8200Ω resistor

TRANSFORMER (HORIZ. OSC.)

ITEM No.	USE	DC RES.		REPLACEMENT DATA						NOTES
		PRI.	SEC	HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L13	87Ω		94Ω	19-1878	TV-163	6210			H-102	28S-5	20.5-45 Millihenries

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	HOFFMAN PART No.	REPLACEMENT DATA
K1	Vert. Integrator	2200MMF, 4700MMF, 4700MMF, 22K, 820Ω, 820Ω	9695	Aerovox PAIO Centralab PC-100 Cornell-DuBilier 1T5MA Erie 1406-01 Sprague V-1

CRYSTAL DIODES

ITEM No.	ORIG TYPE	REPLACEMENT DATA				NOTES
		HOFFMAN PART No.	CBS PART No.	SYLVANIA PART No.		
M1	1N82A	1N82A	1N82A	1N82A	UHF Mixer (Clip-in)	

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	UHF Oscillator	6AF4	
V2	R.F. Amplifier	6BQ7A	
V3	Mixer-Oscillator	6AT6	
V4	1st Video I.F. Amp	6CB6	
V5	2nd Video I.F. Amp	6CB6	
V6	3rd Video I.F. Amp - Video Det. AGC Rect.	6U8	
V7	Video Output	12BY7	
V8	Sound I.F. Amp	6AU6	
V9	Ratio Detector	6AL5	
V10	AF Amplifier	6AV6	
V11	Audio Output	6KBQT	
V12	Sync Sep -Sync Phase Inverter	12AU7	
V13	Vert. Mult.	6CG7	
V14	Vert. Output	6W6GT	
V15	Horiz. AFC	6AL5	
V16	Horiz. Mult	6CG7	
V17	Horiz. Output	6CU6- 6BQ6GTB	
V18	Damper	6AX4GT	
V19	RF Rectifier	1B3GT	
V20	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	HOFFMAN PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V8	21ALP4A 21ALP4A ① 21ALP4 24DP4A ②	21ALP4A ① 21ALP4AB ②	21ALP4A ① 21ALP4GB ②	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA					NOTES
	CAP	VOLT	HOFFMAN PART No	ASEVOVCE PART No	MALLORY DUBILIER PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1A	100	350	4335A	PR3-135	F2347	TC56		Q-231.5	R3169 *
B	60	300							
C	40	350							
C2A	100	350	4339A	PR3-053	F2355	TC39		T-110	R3168 *
B	80	350						MT-0580	
C	50	50							
C3	5	50	4354A (Note 1)	PR550V5	BBR5-50	TC30	TD-5-50	MT-1504	TVA-1305
C4	30	50	4353A (Note 2)	PR550V30	BBR30-150	TC48	TD-30-150	MT-1530	TVA-1420

Note 1 Chassis 32L and 32LU use Part #4353A.
Note 2. Chassis 32L and 32LU use a 5MFD @ 50V (Part #4383A) in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	HOFFMAN PART No.	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	IRC PART No	MALLORY PART No	SPRAGUE PART No	
C5	5									N900
C6	5									N900
C7	15									N150
C8	5									N220
C9	1000			EF-001	MFT-1000				503C-DA	
C10	1000			EF-001	MFT-1000				503C-DA	
C11	1000			EF-001	MFT-1000				503C-DA	
C12	120			DD-152	L10T12	ED-120	UC-5313		5GA-T12	
C13	5									N900
C14	8 8			NPO-8I 6 8	TCZ-6R8	C10V68C	TCC-8 8	ZT-5568		5TCCB-V68
C15	8 8			NPO-8I 6 8	TCZ-6R8	C10V68C	TCC-8 8	ZT-5568		5TCCB-V68
C16	1500			DD-152	BYAUDI5	ED-0015		DC5I5		5HK-D15
C17	1000			EF-001	MFT-1000				503C-DA	
C18	1 3			NPO-8I 1 3	TCZ-1R3	C6V12C	TCC-1 3			5TCCB-V12
C19	3-13									
C20	5-3			EIB-3				DI5-E	CT565A	
C21	1500			DD-152	BYAUDI5	ED-0015		DC5I5		5HK-D15
C22	1000			EF-001	MFT-1000				503C-DA	
C23	1000			EF-001	MFT-1000				503C-DA	
C24	1000			EF-001	MFT-1000				503C-DA	
C25	3-3				TCZ-R3			DI5-E	CT565A	
C26	5				TCC- 5			TCC- 5		
C27	1500			DD-152	BYAUDI5	ED-0015		DC5I5	5HK-D15	
C28	5			DD-050	L10Y5	ED-5		ZT-555	5GA-V5	
C29	10			DD-100	L10Q	ED-10		UC-541	5GA-Q	
C30	1500			DD-152	BYAUDI5	ED-0015		DC5I5	5GA-D15	
C31	68			N750-6I 68	TCN-68	C10Q68U	TCC-68		5TCCU-Q68	N750
C32	470			DD-047	BYAUT47	ED-470		5GA-T47	5GA-T47	
C33	1000			EF-001	MFT-1000				503C-DA	
C34	1000			EF-001	MFT-1000				503C-DA	
C35	3 3	6069		NPO-8I 3 3	TCZ-3R3	T3AV53EC	TCC-3 3		5TCCB-V33	
C36	470	14045		DD-047	BYAUT47	ED-470	UC-5347		5GA-T47	
C37	1000	14045		DD-102	BYAED1	ED-1000	DC52I		5HK-DI	
C38	47	6007		DD-0047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C39	470	14009		DD-047	BYAUT47	ED-470	UC-5347		5GA-T47	
C40	1000	14045		DD-102	BYAED1	ED-1000	DC52I		5HK-DI	
C41	33			NPO-8I 3 3	TCZ-3R3	T3AV53EC	TCC-3 3		5TCCB-V33	
C42	1000	14045		DD-102	BYAED1	ED-1000	DC52I		5HK-DI	
C43	1000	14045		DD-102	BYAED1	ED-1000	DC52I		5HK-DI	
C44	1000	14045		DD-102	BYAED1	ED-1000	DC52I		5HK-DI	
C45	330	6011		DD-331	L10T33	ED-330	UC-5333		5GA-T33	
C46	330	14058		DD-331	L7TG3	ED-330	UC-5333		5GA-T33	
C47	4700	6035		DD-047	DD-472	BYAUD47	ED-0047	UC-5247	5GA-D47	
C48	1000	14045		DD-102	BYAED1	ED-1000	DC52I		5HK-DI	
C49	47	6007		DD-0004	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C50	470	6035		P-488N-1	DF-104	CU84S1		GEM-401	5TM-P1	
C51	047	200	4147	DP-05	DF-503	CUB5I47		GEM-4147	5TM-S47	
C52	47	200	4147	NPO-8I 4 7	TCZ-4R7	CT4BV47C	TCC-4 7		5TCCB-V47	
C53	1	200	4142	P-288N-1	DF-104	CUB5P1		GEM-401	5TM-P1	
C54	470	14009		DD-047	BYAUT47	ED-470	UC-5347		5GA-T47	
C55	470	14009		DD-0047	DD-471	BYAUT47	ED-470	UC-5347	5GA-T47	
C56	470	14009		DD-0047	DD-471	BYAUT47	ED-470	UC-5347	5GA-T47	
C57	1	200		P-288N-1	DF-104	CU84S1		GEM-401	5TM-P1	Note 2
C58	3 3	6069		NPO-8I 3 3	TCZ-3R3	T3AV53EC	TCC-3 3		5TCCB-V33	
C59	47	6007		1469-0004	TCZ-47	1ER5G47	ED-0047		MT-1547	10%
C60	4700	6035		1464-0047		1R5D47	ED-0047		MT-347	5%
C61	4700	6035		DD-047	DD-472	BYAUD47	ED-0047	UC-5247	5GA-D47	
C62	4700	6035		DD-047	DD-472	BYAUD47	ED-0047	UC-5247	5GA-D47	
C63	9083	300		DD-9083	DD-472	CUBD433	ED-3300	GEM-4333	5TM-D33	
C64	4700	6035		DD-047	DD-472	BYAUD47	ED-0047	UC-5247	5GA-D47	
C65	4700	6035		DD-047	DD-472	BYAUD47	ED-0047	UC-5247	5GA-D47	
C66	4700	6035		DD-047	DD-472	BYAUD47	ED-0047	UC-5247	5GA-D47	
C67	4700	6035		DD-047	DD-472	BYAUD47	ED-0047	UC-5247	5GA-D47	
C68	10000	6097		DD-103	BYAB5I	ED-10		DC5I1	5HK-E1	
C69	10000	6097		DD-103	BYAB5I	ED-10		DC5I1	5HK-E1	Note 1
C70	22	600	14032		CUB4P22			GEM-4022	4TM-P22	
C71	0022	200	4180	DD-0022	D6-322	CUBD023	ED-3300	GEM-4222	5TM-D22	

Note 1. Chassis 32L and 32LU use part #4383A in this application.

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	HOFFMAN PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	
C72	220	600	6084	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C73	47		4007	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C74	0047	200	4127	BPD-0047	D8-472	CUBD347	ED-4700	GEM-4347	5TM-D47	
C75	0039	600	4194	1464-0039		1R3D39			MS-339	10%
C76	047	200	4147	BPD-05	DF-503	CUB2347		GEM-4147	2TM-S47	
C77	1	600	4138	P-488N-1	DF-104	CUB5P1		GEM-401	5TM-P1	
C78	1	200	4143	P-288N-1	DF-104	CUB2P1		GEM-401	2TM-P1	
C79	1	600	4211	P-488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C80	1	800	4144	P-588N-1	DF-104	CUB6P1		GEM-401	6TM-P1	
C81	001	600	4178	BPD-001	DD-102	CUB4Q1	ED-1000	GEM-4102	4TM-Q1	
C82	001	200	4179	BPD-001	DD-103	CUB4Q1	ED-1000	GEM-41	4TM-D1	
C83	0047	200		1464-0047		1R5D47		CY20C473K	MS-347	10%
C84	047	200	4147	BPD-05	DF-503	CUB2347		GEM-4147	2TM-S47	
C88	23		4031	51 32	D6-230	LT5G23	ED-23	UC-5432	5GA-G23	
C86	5900		4037	1464-0059		1RSD59			MS-359	10%
C87	470		14009	1464-0004	D6-471	5R5T47	ED-470		MS-347	10%
C88	001	600		1464-001		1R5D1	ED-1000	MCB355	MS-31	10%
C89	470		14009	1467-00047	D6-471	5W5T47	ED-470	UC-5347	1TM-S47	
C90	001	600	4178	1464-001		1R5D1	ED-1000	MCB355	MS-31	10%
C91	1	600	4138	P-488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C92	047	500	4133	DP-05	DF-503	CUB8547		GEM-4147	8TM-S47	
C93	91	3000	14608		D280-930					
C94	82	3000	14608		D280-830					
C95	1	600	4138	P-488N-1	DF-104	CUB5P1		GEM-401	5TM-P1	
C96	82	3000	14608		D280-820					

Note 1. Chassis 32L and 32LU use an .015MFD @ 600V (Part #1432) in this application.
Note 2. Some versions may use a .33MFD @ 300V (Part #4131) in this application.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	HOFFMAN PART No	CENTRALAB PART No	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	
R1A	500K	1	4875A ①	BT-46	A47F3-500K		UT-457	Volume - Tap @ 100K - Note 1
B	Shaft			Not Req.	K2S-3		Not Req.	
C	Switch			K3-3	SWE-20		US-27	AC On-Off & Spot Eliminator
R2A	1Meg	1	4878A	B-7S	A47-134Meg-S	Q1J-139	U56	Tone
B	Shaft			Not Req.	K2S-3	Not Req.	Not Req.	
R3A	150K	1	4879A	AB-43	A47-150K-S	Q1J-938	U43	Brightness
B	Shaft			AK-4	K2S-3	Not Req.	Not Req.	
R4A	1.25Meg	1	4877A	B-8S	A47-1Meg-S	Q1-137	U54	Vert Hold
B	Shaft			Not Req.	K2S-3	Not Req.	Not Req.	
R5A	500Ω	1	4883A					Contrast
B	Switch							Sync
R6A	3000Ω	2	4837A	WH-323	A42-3000	WP82000	R3500L	Vert. Linearity - Wire wound
B	Shaft			Not Req.	F2S-1/4	Not Req.	Not Req.	
R7A	2Meg	1	4965	BX-7S	A47-2Meg-S	Q1J-139	TA36L	Vert. Height
B	Shaft			Not Req.	F2S-1/4	Not Req.	Not Req.	
R8A	1Meg	1	4970	AB-46	A47-134Meg-S	Q1J-141	TA56L	Area (AGC)
B	Shaft			AK-4	F2S-1/4	Not Req.	Not Req.	
R9A	50K	1	4964	BX-51	A47-50K-S	Q1J-33	TA54L	Horiz. Drive
B	Shaft			Not Req.	F2S-1/4	Not Req.	Not Req.	
R10A	2Meg	1	4965	BX-7S	A47-234eg-S	Q1J-139	TA36L	Focus
B	Shaft			Not Req.	F2S-1/4	Not Req.	Not Req.	

Note 1. Chassis 32L and 32LU use part #4883A in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	HOFFMAN PART No.	IRC PART No.	
R11	680K			BTB-680K	
R12	680K			BTB-680K	
R13	10K			BTB-10K	
R14	680K			BTB-680K	
R15	10K			BTB-10K	
R16	100K			BTB-100K	
R17	820K			BTB-820K	
R18	560K			BTB-560K	
R19	6800Ω			BTB-6800	
R20	100K			BTB-100K	
R21	330Ω			BTA-330R	
R22	3300Ω	1		BTA-3300	
R23	1K			BTB-1K	
R24	10K			BTB-10K	
R25	680Ω			BTB-680R	
R26	220K			BTB-220K	
R27	1800Ω	1	24518	BTA-1800	Note 1
R28	2200Ω		4650	BTB-2300	Note 2
R29	6.2Meg		34659	BTB-6.2Meg	
R30	470K		4652	BTB-470K	
R31	1.5Meg		4805	BTB-1.5Meg	
R32	330Ω		4653	BTB-330R	
R33	470Ω		4638		
R34	47K		4650		
R35	470Ω		4638		
R36	47Ω		4639	BTB-47	
R37	470Ω		4636		
R38	22K		4636	BTB-22K	
R39	470Ω		4638		
R40	47Ω		4639	BTB-47	
R41	470Ω		4638	BTB-470	
R42	180Ω		14619	BTB-180	
R43	1000Ω	2	4654	BTB-1000	
R44	22K		4636		
R45	330K		34631	BTB-330K	
R46	2.2Meg		4806		
R47	4700Ω		4576	BTB-4700	
R48	18K		4646	BTB-18K	
R49	4700Ω	4	44613		
R50	10K		4597	BTB-10K	
R51	3700Ω		4603	BTB-3700	
R52	6800Ω		4577	BTB-6800	
R53	150Ω		4618	BTB-150	
R54	180Ω		14618	BTB-180	
R55	27K		34618	BTB-27K	
R56	10K		4597	BTB-10K	
R57	10K		4597	BTB-10K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	HOFFMAN PART No.	IRC PART No.	
R58	33K			BTB-33K	
R59	10Meg		4655	BTB-10Meg	
R60	330K		4618	BTB-330K	
R61	470K		4652	BTB-470K	
R62	5600Ω		4639	BTB-5600	
R63	560Ω	1	4631	BTA-560	
R64	10K		4597	BTB-10K	
R65	100K		4650	BTB-100K	
R66	2.2Meg		4806	BTB-2.2Meg	
R67	330K		34631	BTB-330K	
R68	470K		4652	BTB-470K	
R69	2200Ω 5%	1	34528	BTA-2300 5%	
R70	2200Ω	1	4636	BTA-2300	
R71	1800Ω		4640	BTB-1800	
R72	18000 5%		34617	BTB-18000 5%	
R73	470Ω		4638	BTB-470	
R74	4.7Meg		34659	BTB-4.7Meg	
R75	180K	1	34529	BTA-180K	
R76	560K	1	34671	BTA-560K	
R77	10000 5%		34618	BTB-10000 5%	
R78	1.2Meg		34583	BTB-1.2Meg	
R79	100Ω		4648	BTB-100	
R80	470Ω	1	4631	BTA-470	
R81	2000Ω		4632	BTB-2000	
R82	33K		4618	BTB-33K	
R83	4.7Meg		34659	BTB-4.7Meg	Note 3
R84	560Ω			BTB-560	
R85	560Ω			BTB-560	
R86	100K		4571	BTB-100K	
R87	100K		4571	BTB-100K	
R88	4.7Meg		34659		
R89	470K		4823	BTB-470K	
R90	6800Ω		4577		
R91	100K		4575	BTB-100K	
R92	33K		34678	BTB-33K	
R93	1500Ω 5%		4610	BTB-1500 5%	
R94	5600Ω		4639		
R95	330K		4653	BTB-330K	
R96	1000Ω	2	14658	BTB-1000	
R97	12K	2	34593	BTB-12K	
R98	4700Ω		4576	BTB-4700	
R99	150	1	14606	BTA-15	
R100	2.2Ω		4795	BW1-2.2	
R101	5600Ω		4639	BTB-5600	
R103	3000Ω	7	4717A	PW7-3000	Note 4
R103	15Ω	7	4702A		
R104	330K		34631	BTB-330K	

Note 1. A 2700Ω, 1W used with Tuner #9906.
Note 2. A 1200Ω used with Tuner #9905 and a 3.3K used with Tuner #9906.
Note 3. Not used in Chassis 32L and 32LU.
Note 4. A 3000, wire wound, used in Chassis 32L and 32LU.

TRANSFORMER (POWER)

ITEM No.	RATING		REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SEC. 3	HOFFMAN PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC	370VCT	5V	6.3V	9078		P-3857 ①		26R69 ①	
	@1.5A	@ 270A	@ 3A	@ 10A						

① Parallel and phase 6.3V filament windings

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							
		HOFFMAN PART No.	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Output	21900①	A-3833 ①	MDF-25①	225IR ①	V307①	A-8143 ①	26S72 ①	A-108X ②
T3	Yoke-Horiz (90MH) (80°) Vert (41MH)	9980	DP807 ① ②			V807① ②	DY-15A ① ②	V-16 ① ②	Y-14 & NW4 ③ ④
M5	Rear Cover and Shielding	10036							
T4	Horiz Output	8158A	FB42S * ①	HVO-38 * ①	219T1 * ①	2094 * ①	SO-25S * ①	FLY-16 * ①	D-96 * ①
T5	Width Coil	9494	RP800①	MWC-1①	218A1	2081①	WC-8 ①	WC-18	WLC-8

① Use 8 to 1 turns ratio.
② Drill new mounting hole(s)
③ Use original horizontal sweep LC necessary
④ This part may be superceded by Parts Manufacturer's introduction of equivalent unit for this application
5. Connect horizontal damping capacitor (C96) across terminals #3 and #7.
6. Use terminals #1 and #3.
7. Use terminals #1 and #3.
8. Enlarge mounting hole.
9. Change mounting hole.

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	9	9	9	9	8	9	5
7	7	7	7	7	7	7	4
6	7	7	7	7	7	7	3
3	3	3	3	3	3	3	2
2	1	1	1	1	1	1	1
Connect Width Coil Across:	2 & 3	1 & 3	1 & 3	1 & 3	1 & 3	1 & 3	1 & 3

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC	HOFFMAN PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	
T6	7500Ω	3-4Ω	8187A ①	Z2006	A-3901	A-3949	28S48	S-9Z	① Used in Ch. 32L, U
	7500Ω	3-4Ω	8180A ②	Z2015	A-3901	A-3878	24S53	S-7X	② Used in Ch. 32, U

SPEAKER

ITEM No	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C IMP	HOFFMAN PART No	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	9061 ①	5SA1	① Used in Models M111, U; B111, U; W111, U; M131, U; W132, U; B131, U; P132, U
	4"	PM	3-4Ω	9117 ②	4A07	② Used in Models M208, U; B208, U; B208, U; M206, U
	6"x11"	PM	3-4Ω	9079 ③		③ Used in Models M307, U; W307, U; B307, U; P307, U; P308, U
	10"	PM	3-4Ω	9078 ④	10A81	④ Used in Models M306, U; B306, U; W306, U; EP306, U; M314, U; W314, U; B314, U; P314, U
	12"	PM		9130 ⑤		⑤ Used in Models M310, U; B310, U; W310, U;P310, U

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA				NOTES
		HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Video IF	8189A	17-4534	TV-181	6236	
L2	Ind. Video IF	8194A	17-4535		6235	Includes 4L 35MC Trap
L3	3rd. Video IF	8187A	17-4536		6233	Includes 4T 35MC Trap
L4	4th. Video IF	8184A	17-5004	TV-182	6234	
L5	Series Peaking Coil	8383A	19-3100	TV-181	6177	100 Microhenries
L6	Shunt Peaking Coil	8387A			6161	150 Microhenries
L7	Series Peaking Coil	8382A	19-4400 *		6154 *	290 Microhenries, wound on #3002 resistor
L8	4.5MC Trap	8381A	20-1004	TV-181	6160	
L9	Shunt Peaking Coil	8386A	19-3500		6158	470 Microhenries
L10	Sound IF	8211A	20-1004	TV-181	1460	
L11	Ratio Det.	8383A	17-3497	TV-115	6305	Tertiary windings-50

* Parallel with #3002 resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No	USE	DC RES.		REPLACEMENT DATA						NOTES
		PRI.	SEC	HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L12	6Ω		944T		19-1576	TV-162	6310		H-102	28S-5	30.5-45 Millihenries

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	HOFFMAN PART No.	REPLACEMENT DATA
K1	Vert. Integrator	2300MMF, 4700MMF, 4700MMF, 22K, 8200Ω, 8200Ω	9605	
				Aerovox P-410 Centralab PC-100 Cornell-Dubilier 1HTM1 Erie 1406-6 Sprague V-1

CRYSTAL DIODES

ITEM No	ORIG. TYPE	REPLACEMENT DATA			NOTES
		HOFFMAN PART No.	CBS PART No.	SYLVANIA PART No.	
M1	1N82A		1N82A	1N82A	UHF Mixer (Clip-in)

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M2	Pilot Light		Type #47 (Not used in some versions)
M3	Tuner	9884-1	UHF-VHF (Ch. 321U & 322U)
	Tuner	9922	UHF-VHF (Ch. 321U & 322U)
	Tuner	9906	VHF (Ch. 322)
	Tuner	9908	VHF (Ch. 322, Code C)
	Tuner	9905	VHF (Ch. 321)
M4	Centering Device	10028	Includes yoke rear cover
M5	Ion Trap	9702	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Cabinet	7944	Black - Models B1081, U, K1081, U
Cabinet	7945	Oak - Models B1081, U, K1081, U
Cabinet	7998	Mahogany - Models B1091, U, M1091, U
Cabinet	7999	Oak - Models M1111, U, B1111, U, W1111, U
Cabinet	7974	Mahogany - Models M1111, U, B1111, U, W1111, U
Cabinet	7975	Oak - Models M1111, U, B1111, U, W1111, U
Cabinet	7976	Walnut - Models M1111, U, B1111, U, W1111, U
Cabinet	7972	Oak - Models B1121, U
Cabinet	7973	Cherry - Models P1121, U
Cabinet	7970	Mahogany - Model M1121U
Cabinet	7971	Walnut - Model M1121U
Cabinet	7993	Walnut - Models M3071, U, W3071, U
Cabinet	7990	Mahogany - Models M3071, U, W3071, U
Cabinet	7980	Cherry - Models M3061, U, B3061, U, W3061, U, SP3061, U
Cabinet	7977	Mahogany - Models M3061, U, B3061, U, W3061, U, SP3061, U
Cabinet	7978	Oak - Models M3061, U, B3061, U, W3061, U, SP3061, U
Cabinet	7979	Walnut - Models M3061, U, B3061, U, W3061, U, SP3061, U
Cabinet	7991	Oak - Models B3071, U, P3071, U
Cabinet	7992	Cherry - Models B3071, U, P3071, U
Cabinet	7989	Cherry - Models P3091, U
Cabinet	7984	Cherry - Models M3101, U, B3101, U, W3101, U, P3101, U
Cabinet	7981	Mahogany - Models M3101, U, B3101, U, W3101, U, P3101, U
Cabinet	7982	Oak - Models M3101, U, B3101, U, W3101, U, P3101, U
Cabinet	7983	Walnut - Models M3101, U, B3101, U, W3101, U, P3101, U
Cabinet	7985	Mahogany - Models M3114, U, W3114, U
Cabinet	7987	Walnut - Models M3114, U, W3114, U
Cabinet	7986	Oak - Models B3114, U
Cabinet	7988	Cherry - Models P3114, U

			UHF-VHF Versions			VHF Versions						
Model	Safety Glass	Mask	Knob UHF Channel Selector	Knob VHF Channel Selector	Knob Fine Tuning	Knob VHF Channel Selector	Knob Fine Tuning	Knob On-Off Volume	Knob Tone	Knob Brightness	Knob Contrast	Knob Vert. Hold
B1081U	821	22066	K33765	K33766	K33783			K3835A		K3833A	K3834A	K3832A
B1091U	821	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
B1111U	821	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
B1121U	819	22066	B33765	B33766	B33783			B33789	B33792	B33790	B33788	B33791
B3061U	821	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
B3071U	819	22066	B33765	B33766	B33783			B33789	B33792	B33790	B33788	B33791
B3101U	819	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
B3114U	818	22068	B33765	B33766	B33783			B33789	B33792	B33790	B33788	B33791
K1081U	821	22066	K33765	K33766	K33783			K3835A		K3833A	K3834A	K3832A
M1091U	821	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
M1111U	821	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
M1121U	819	22066	M33765	M33766	M33783			M33789	M33792	M33790	M33788	M33791
M3061U	821	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
M3071U	819	22066	M33765	M33766	M33783			M33789	M33792	M33790	M33788	M33791
M3101U	819	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
M3114U	818	22068	M33765	M33766	M33783			M33789	M33792	M33790	M33788	M33791
P1121U	819	22066	P33765	P33766	P33783			P33789	P33792	P33790	P33788	P33791
P3071U	819	22066	P33765	P33766	P33783			P33789	P33792	P33790	P33788	P33791
P3091U	819	22066	P33765	P33766	P33783			P33789	P33792	P33792	P33788	P33791
P3101U	819	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
P3114U	818	22068	P33765	P33766	P33783			P33789	P33792	P33790	P33788	P33791
SP3061U	821	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
W1111U	821	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
W1121U	819	22066	M33765	M33766	M33783			M33789	M33792	M33790	M33788	M33791
W3061U	821	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
W3071U	819	22066	M33765	M33766	M33783			M33789	M33792	M33790	M33788	M33791
W3101U	819	22066	M33765	M33766	M33783			M3835A		M3833A	M3834A	M3832A
W3114U	818	22068	P33765	P33766	P33783			M33789	M33792	M33790	M33788	M33791
B1081	821	22066				K33781	K3928A	K3835A		K3833A	K3834A	K3832A
B1091	821	22066				M33781	M3928A	M3835A		M3833A	M3834A	M3832A
B1111	821	22066				M33763	M33764	M3835A		M3833A	M3834A	M3832A
B1121	819	22066				B33763	B33764	B33789	B33792	B33790	B33788	B33791
B3061	821	22066				M33781	M3928A	M3835A		M3833A	M3834A	M3832A
B3071	819	22066				B33763	B33764	B33789	B33792	B33790	B33788	B33791
B3101	819	22066				M33763	M33764	M3835A		M3833A	M3834A	M3832A
B3114	818	22068				B33763	B33764	B33789	B33792	B33790	B33788	B33791
K1081	821	22066				K33781	K3928A	K3835A		K3833A	K3834A	K3832A
M1091	821	22066				M33781	M3928A	M3835A		M3833A	M3834A	M3832A
M1111	821	22066				M33763	M33764	M3835A		M3833A	M3834A	M3832A
M1121	821	22066				M33763	M33764	M33789	M33792	M33790	M33788	M33791
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M3101	819	22066				M33763	M33764	M3835A		M3833A	M3834A	M3832A
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P3091	819	22066				P33763	P33764	P33789	P33792	P33790	P33788	P33791
P3101	819	22066				M33763	M33764	M3835A		M3833A	M3834A	M3834A
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SP3061	821	22066				M33781	M3928A	M3835A		M3833A	M3834A	M3832A
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W3101	819	22066				M33763	M33764	M3835A		M3833A	M3834A	M3834A
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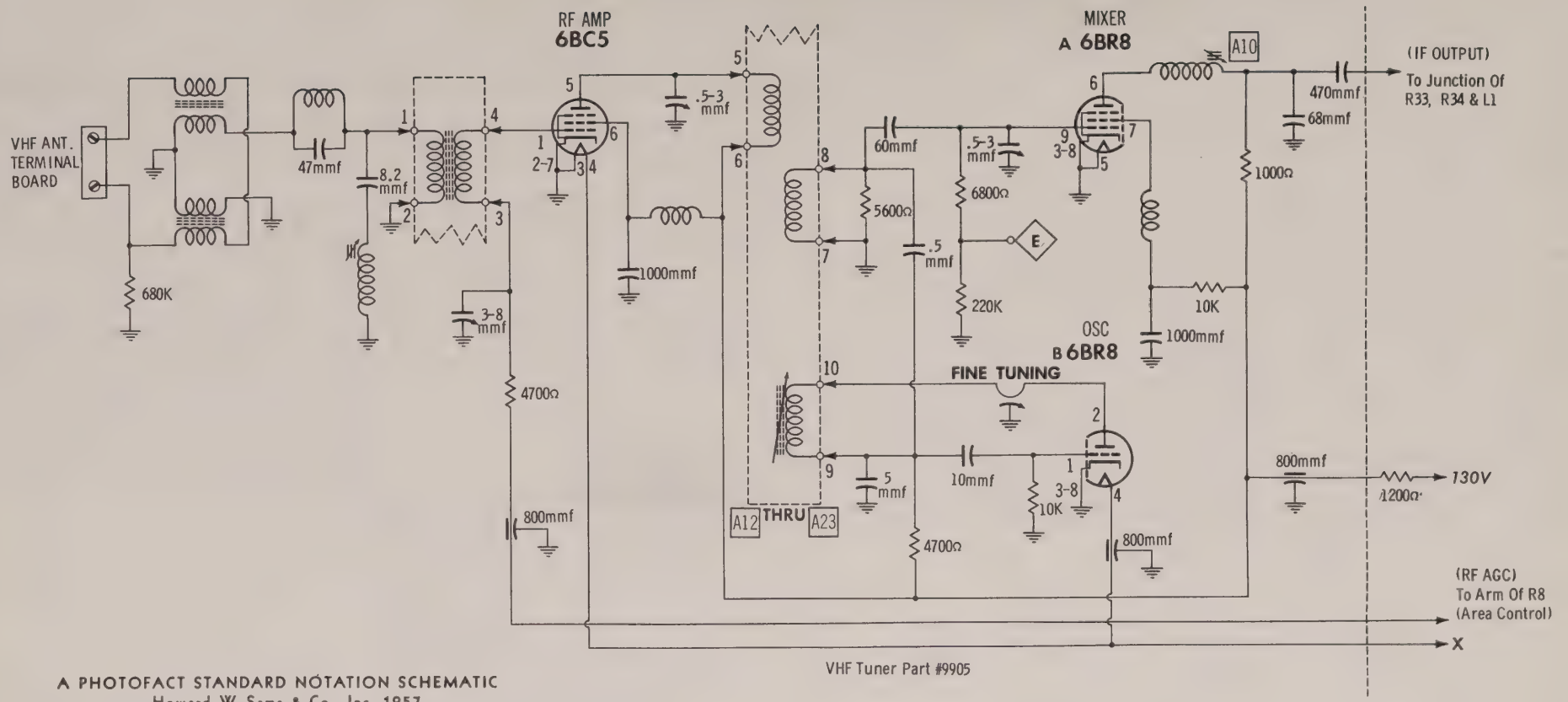

VHF Tuner Part #9905

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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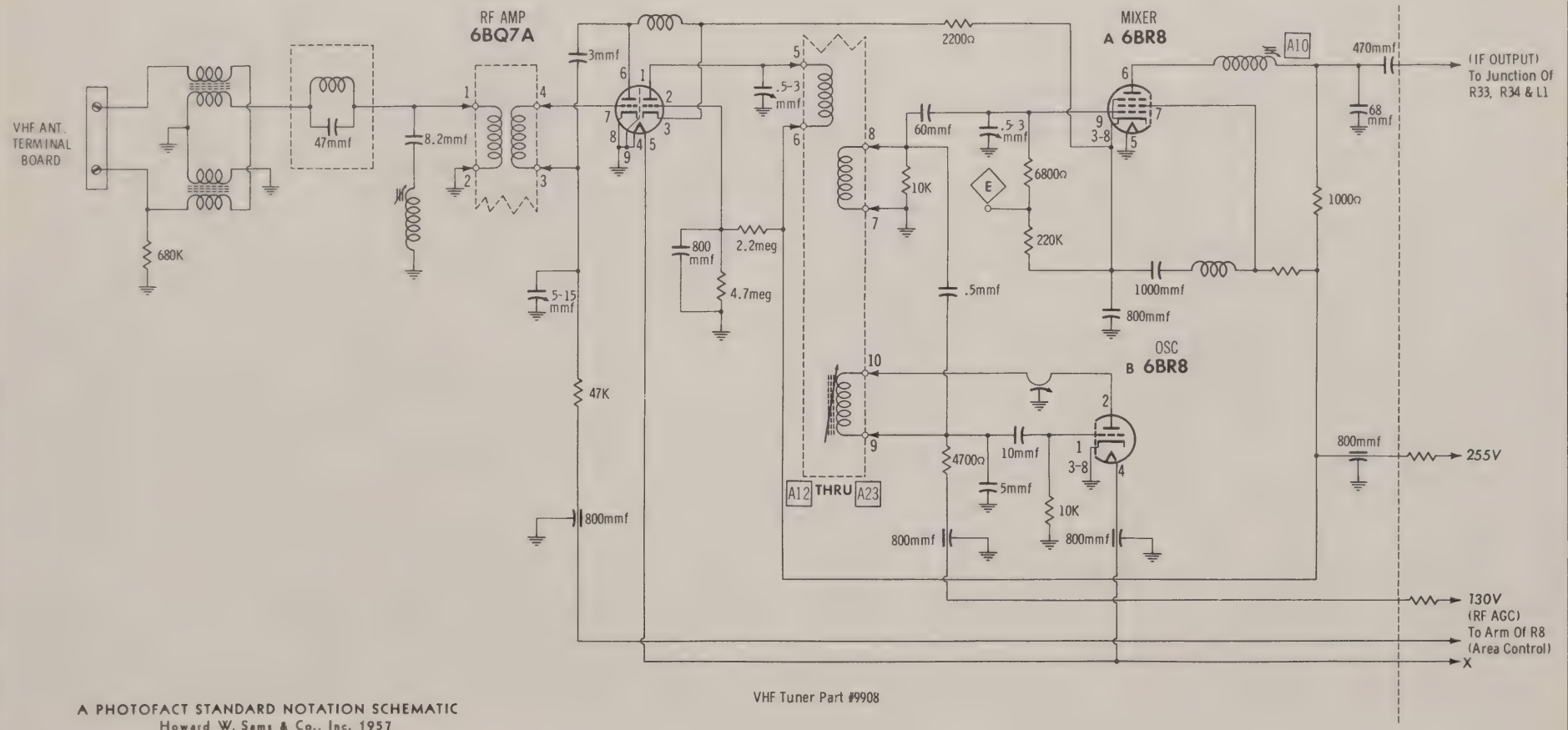
ALTERNATE TUNER SCHEMATIC



VHF Tuner Part #9908

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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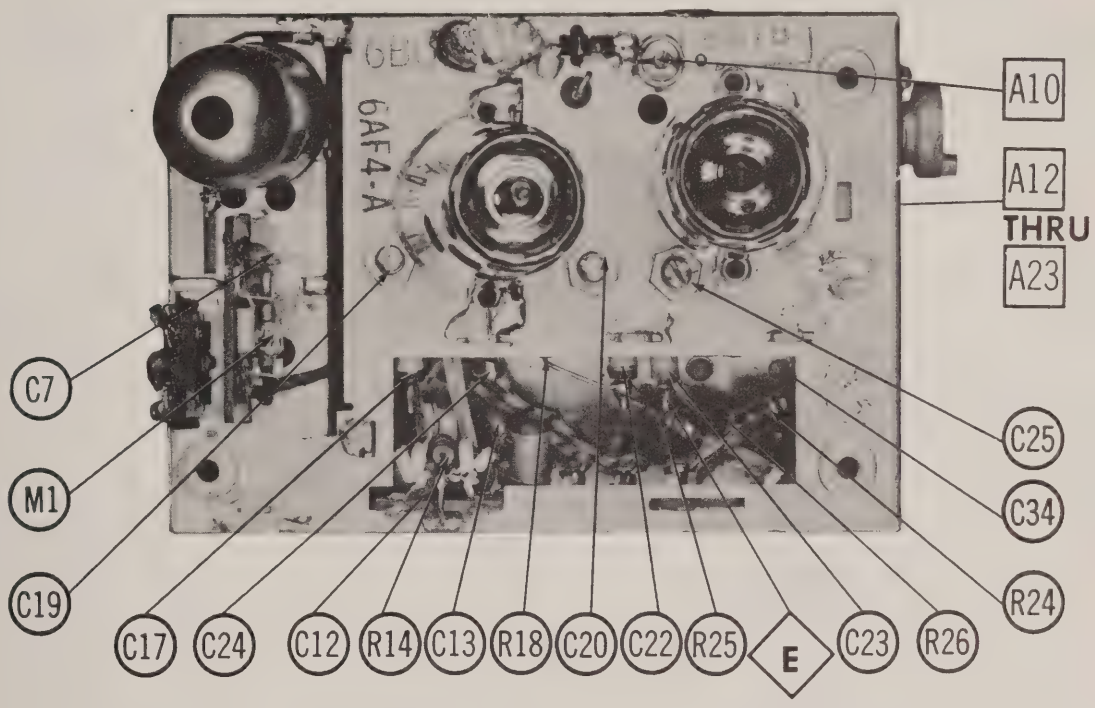
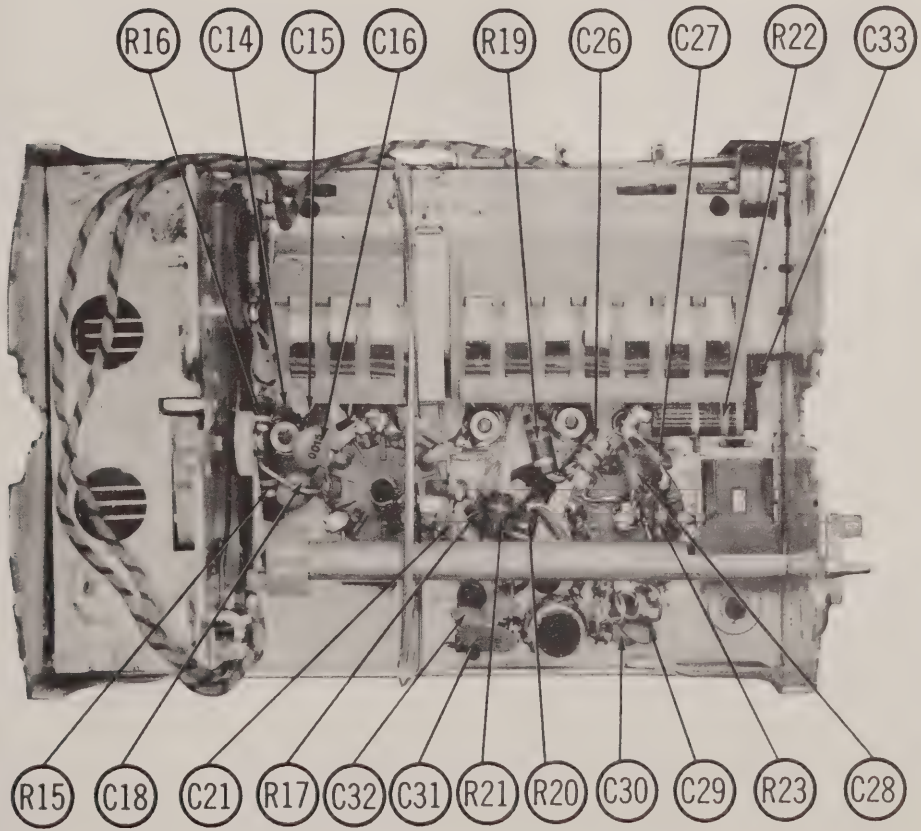
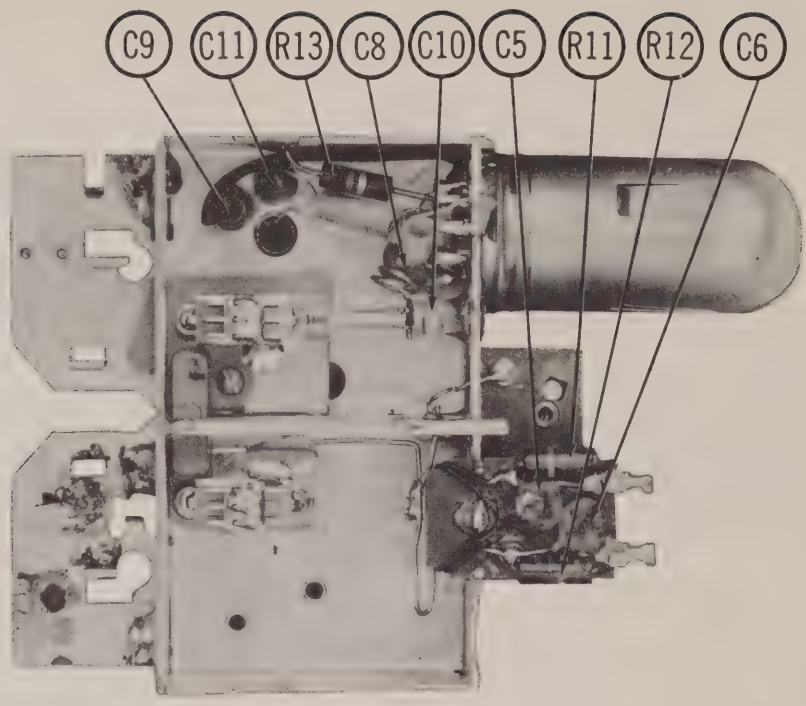
ALTERNATE TUNER SCHEMATIC



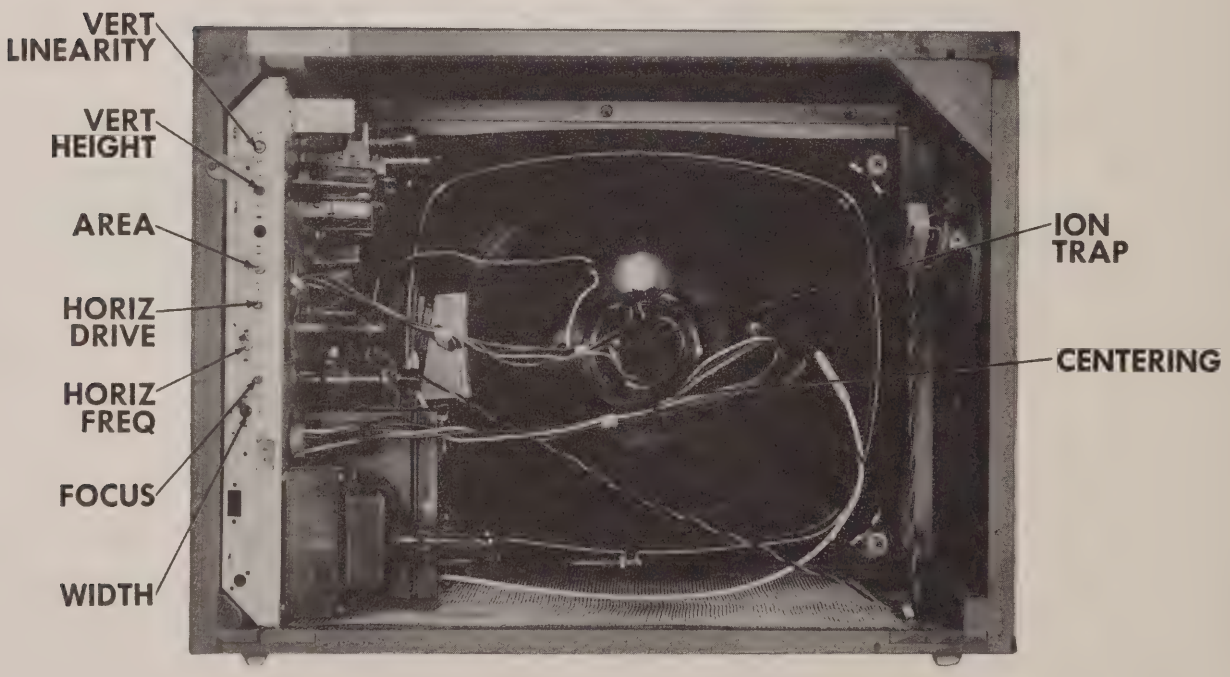
RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



RF TUNER SIDE VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast controls for a normal picture.

3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive control (R9) until white lines disappear.

6. If in step 5 the horizontal drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.

7. Adjust the width slug (B1) for a raster slightly wider than necessary to fill the picture mask horizontally.

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KNIGHT
MODELS 99RZ177, 99RZ936

KNIGHT
MODELS 99RZ177, 99RZ936

GENERAL INFORMATION

The Knight Models 96RZ936 and 99RZ177 features pushbutton control for playback, record, stop, fast forward and fast reverse. Double track recording is used doubling the recording time on a single reel of tape. Any reel size up to 7" can be used. Two neon indicator lights simplify the recording level setting. Recordings can be made from a radio, phonograph or television in addition to those made directly with the microphone. New recordings may be made on previously recorded tape because the erase head is automatically positioned when pressing the record button. Recordings may be played back through the built in speakers or an external speaker may be plugged into one of the External Speaker Jacks.

Using both tracks of the tape the recording time is as follows:

Size Reel	3 3/4" Speed	7 1/2" Speed
5" reel (600 ft.)	1 hour	1/2 hour
7" reel (1200 ft.)	2 hours	1 hour

The Knight is designed to operate on 115V, 60 cy. AC supply only. Before connecting to a line supply be absolutely certain it agrees with the above specifications.

Supplied By:

Allied Radio Corporation
833 West Jackson Boulevard
Chicago 7, Illinois

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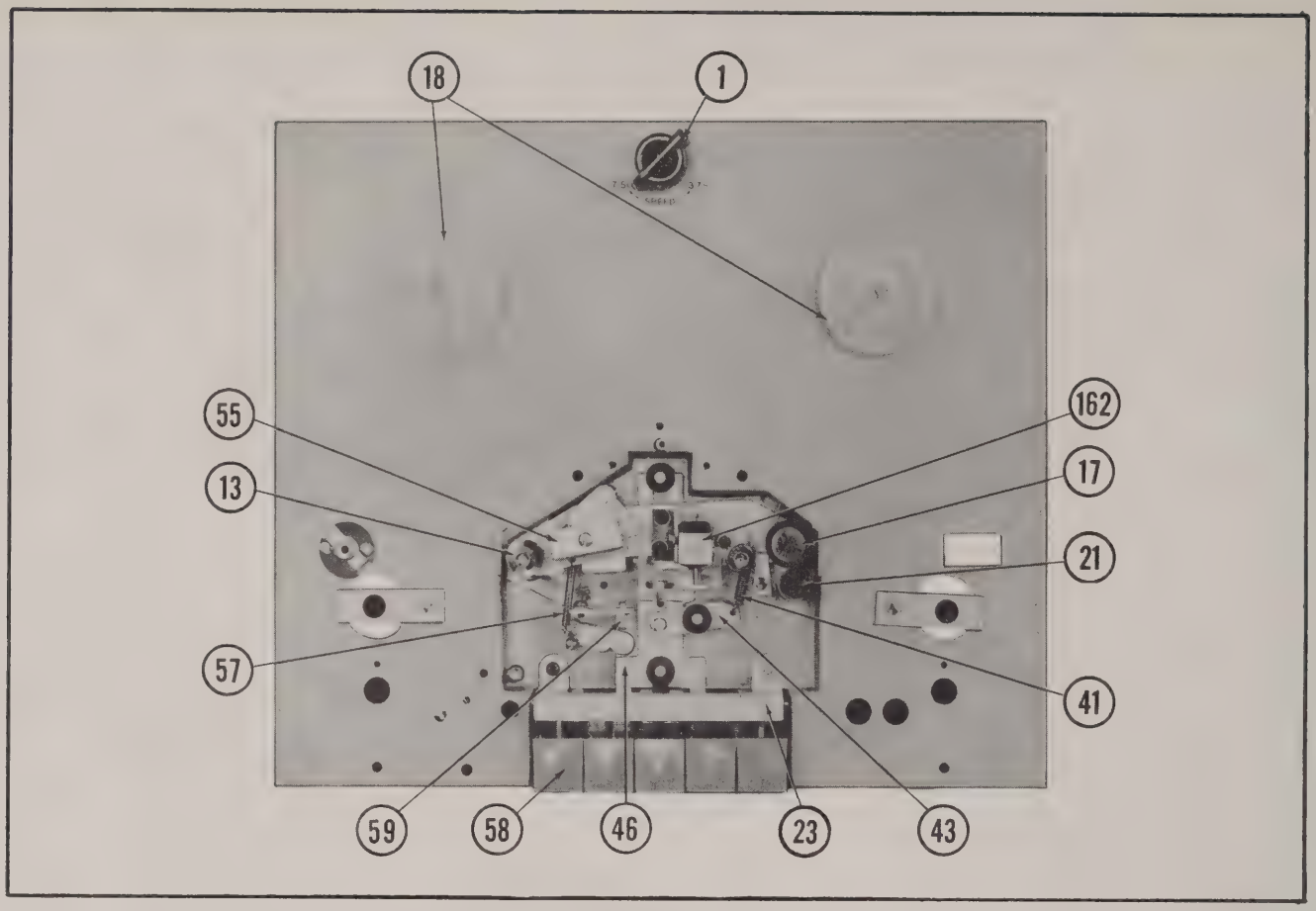

Figure 1

OPERATING INSTRUCTIONS

Preparation For Operation:

1. Remove the AC power cord, microphone, reel of tape and empty reel from the storage compartment.

2. Depress the stop button.

3. Plug the AC cord into a convenient wall receptacle of the proper rating.

4. Set speed control knob to 3.75 or 7.50 as desired.

5. Place "Remote-Normal" switch in "Normal" position.

CAUTION: Do not turn speed change knob unless "Stop" button is depressed.

When the Forward or Reverse buttons are depressed the Record and Playback buttons are locked so they cannot be depressed. This eliminates the possibility of spilling tape. The buttons must be depressed firmly until they latch, and the "Stop" button must be depressed before changing functions or speed of the recorder.

IMPORTANT: Always depress the "Stop" button when the unit is not in use. This prevents the pinch roller from becoming flattened against the capstan.

Speed Change Knob:

This recorder has two speeds 3.75 inches per second or 7.5 inches per second. The arrow on the speed change knob should point at 3.75 or 7.50 according to the speed desired.

CAUTION: Always depress the "Stop" button before attempting to change speed. Turning the speed change knob while the unit is running will not change speed and can result in damage to the mechanism.

Threading The Tape:

1. Place a full reel of tape on the left (supply) spindle, being certain the slots in the reel engage the protrusions on the spindle pan. Unwind about 14" of tape from the supply spindle.

2. Insert free section of tape into the tape slot. Place empty reel on the right (take-up) spindle.

3. Insert free end of tape into one of the slots in the empty reel hub. Hold the tape in place and turn the reel two or three turns until the tape is secured.

4. The dull side of the tape should face away from the operator and toward the rear of the unit.

To Record From Microphone:

1. Turn the On-Off Volume control to the right

until a click is heard and then allow 30 seconds for the unit to warm up. The pilot light located above the "Stop" button will glow when the unit is turned on.

2. Insert the microphone plug into the "Microphone" jack.

3. Push the record lock button down with the left hand and hold. This releases the safety lock which prevents accidental erasure of recorded material.

4. Depress the "Record" button with the right hand until it latches. Release the lock button.

5. Adjust the "Volume" control until the "Normal" indicator just flashes while speaking into the microphone. If the "Volume" control is advanced too far the "Overload" indicator will flash and the recording will be distorted. To prevent overload and distortion turn the volume control down to a point where the "Overload" indicator does not flash.

6. The "Tone" control does not function during recording. When recording from a radio, set the radio tone control for maximum treble.

To Record From Radio, TV, Or Phonograph:

1. Insert the phonograph pick-up plug into the "Radio-P.A.-Phono" jack.

2. For radio or TV recording, connect patch cord, Part No. 96R674, to the voice coil of the radio or TV speaker by means of the alligator clips. Plug into the "Radio-P.A.-Phono" jack.

3. Proceed as described under "To Record From Microphone".

NOTE: Remove patch cord when recording is completed.

To Use Second Track:

1. Depress "Stop" button when all tape is wound on the take-up reel.

2. Remove reel containing tape and empty reel. Place full reel on left (supply) spindle and empty reel on right (takeup) spindle.

3. Thread tape and proceed as previously described.

To Play Recordings:

1. Turn unit on with volume control knob.

2. Thread tape as described under "Threading The Tape".

3. Set the speed change knob (1) to the speed at which the recording was made.

4. Depress the "Play" button until it latches.

5. Adjust "Volume" and "Tone" Controls to desired listening levels.

High Speed Forward Or Reverse:

When it is desirable to play a section of tape over again it is not necessary to play or rewind the entire tape. By depressing the "Forward" or "Reverse" button the tape will advance or rewind at a rapid speed.

Several minutes of normal recording can be skipped in a few seconds by the "Forward" or "Reverse" buttons.

Tape Timer:

If, when making recordings or playing a recorded tape, you wish to play back a certain recording, note the reading on the time scale when a particular recording is being made or heard. Rewind the tape until that number appears on the scale, press the "Stop" button, then press the "Play" button and you will be listening to the desired recording.

When starting a new reel of tape or re-recording a reel, reset the indicator pointer to "0" by rotating the reset knob (5). By starting at "0" on all tapes, the number location can be catalogued for each selection on any reel.

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To Edit And Splice Tape:

NOTE: It is impossible to edit and splice one track without affecting the second track of recorded material, therefore recordings to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted sections, or by joining selections into another sequence. Announcements can be added between selections, etc. Unused sections of tape may be spliced together for re-use.

2. For best results cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

Erasing Recorded Material:

When the "Record" button is depressed the erase head is automatically positioned to erase any previous recording before a new one is made. Material may be erased when no longer needed, without recording, by turning the volume control to the extreme counter-clockwise position, or minimum volume position, and depress the "Record" button. To erase the second track, reverse the reels and repeat the above operation.

To Use Recorder As A Public Address System:

Insert the Microphone into the "Microphone" input jack. Plug in an extension speaker, or speakers if desired, and depress the "Record" button. Set the "Volume" and "Tone" controls to the desired listening level. A recording can be made at the same time with a tape placed on the unit in the normal manner.

CAUTION: When using the unit as a public address system, the Microphone must be kept as far away from the speakers as possible to prevent "feedback" squeal.

Remote Control Operation:

A socket and switch are provided to allow remote operation up to a distance of 18 feet on either recording or playback. This is accomplished by remote control cable No. 96R636. Connect remote control cable as follows:

1. Set remote control cable switch at end of cable to "Standby" position.

2. Insert cable plug into remote socket.

3. Set the control switch on the remote socket to the "Normal" position. Start the recorder in the usual manner and set the "Volume" control to the proper level.

4. Set the control switch on the set to the "Remote" position. The tape will stop.

The recorder may now be operated (start and stop) by means of the remote cable switch. When starting the recorder by means of the remote control, the switch should be rotated to the "Motor" position and then to the "Record-Playback" position after a slight pause in the "Motor" position. To stop recording or playback, rotate the control switch directly to the "Standby" position, with just a slight pause at the "Motor" position.

ADJUSTMENTS

Record-Play Head Adjustment:
(See Exploded View, Fig. 3A)

To adjust the record-play head (162) for maximum frequency response, adjust as follows:

1. Remove the rear escutcheon (6) and rear escutcheon plate (7).

2. Thread an alignment tape or a good recorded tape on the machine.

3. Set the controls as described under "To Play Recordings".

4. Adjust screw (33) by turning it in and out until the maximum high frequencies are obtained. Replace escutcheon and plate.

Pressure Pad Adjustment:

1. Remove front escutcheon (11).

2. Depress the "Play" button. Do not turn the recorder on.

3. Using a pencil type postal scale, check the amount of pressure required to just pull the pad away from the tape. The test should be made on the end of the pressure pad mounting spring (60). Adjust the pressure pad for 1 3/4 oz. $\pm$ 1/4 oz. pressure.

(a) The record head pressure pad is adjusted by locked adjusting screw (59).

(b) The guide post pressure pad is adjusted by bending the pressure pad spring. It must be adjusted for minimum pressure against the tape.

4. After the adjustments depress the "Stop" button and replace the front escutcheon.

Erase Head Adjustment:

1. With tape properly threaded, turn on recorder and depress the "Record" button. Allow tape to run for a few seconds and turn recorder off, leaving the "Record" button depressed.

2. With the escutcheons removed check the erase head (55) to see if it is parallel with the tape.

3. Check to see if the top edge of the tape coincides with the top end of the long diagonal slot in the erase head (Junction of long diagonal slot and short vertical slot). To adjust level of tape, loosen set screw (12) in left tape guide post, and rotate guide post to move tape up or down. Tighten set screw.

Brake Shoe Adjustment:

1. In order to adjust the brake shoes it is necessary to remove the mechanism from the carrying case and disconnect the speaker.

2. With all buttons in the up position the brake shoes (91) should clear the drums (67) approximately 1/8 inch.

3. Depress the stop button while observing the brake shoes. Both brake shoes must contact the drums at the same time and with equal pressure.

4. Adjustment is made by bending the spring arms.

Adjustment For Slow Take-Up Reel:

There are instances where the spring drive belt (61) stretches after a period of time. When this occurs the takeup torque will be insufficient to wind the tape properly on the take-up reel. In this case the belt should be replaced as follows:

1. Remove the rear escutcheon (6) and rear escutcheon plate (7). Remove the mechanism from the carrying case.

2. Loosen set screw (68) on brake drum (67) and slide take-up spindle (18) upward until the belt can be removed from the groove on the spindle.

3. Remove the belt from around the spindle and remove spindle. Remove the belt from around the pinch roller (17), and from the recorder.

4. Install new belt by reversing the above procedure.

Bias Adjustment:

Turn the recorder on and depress the "Record" button using no tape. To determine if the bias is within satisfactory limits without dismantling the unit, merely connect a VTVM from the top lug of the recording head to chassis. If 75 to 100 volts are present no adjustment is necessary.

If the readings are outside of this range, proceed as follows:

1. Try a new 6AQ5T, 12AX7, 6AQ5, and 5Y3.

2. If still not within range, remove the chassis and connect a low capacity VTVM from test point "A" to ground. Adjust trimmer (C-12) for maximum reading. Adjust trimmer (C-13) to obtain a reading of 2.25 volts. This provides the optimum in performance.

Neon Record Level Indicators:

The neon record indicator firing level adjust-

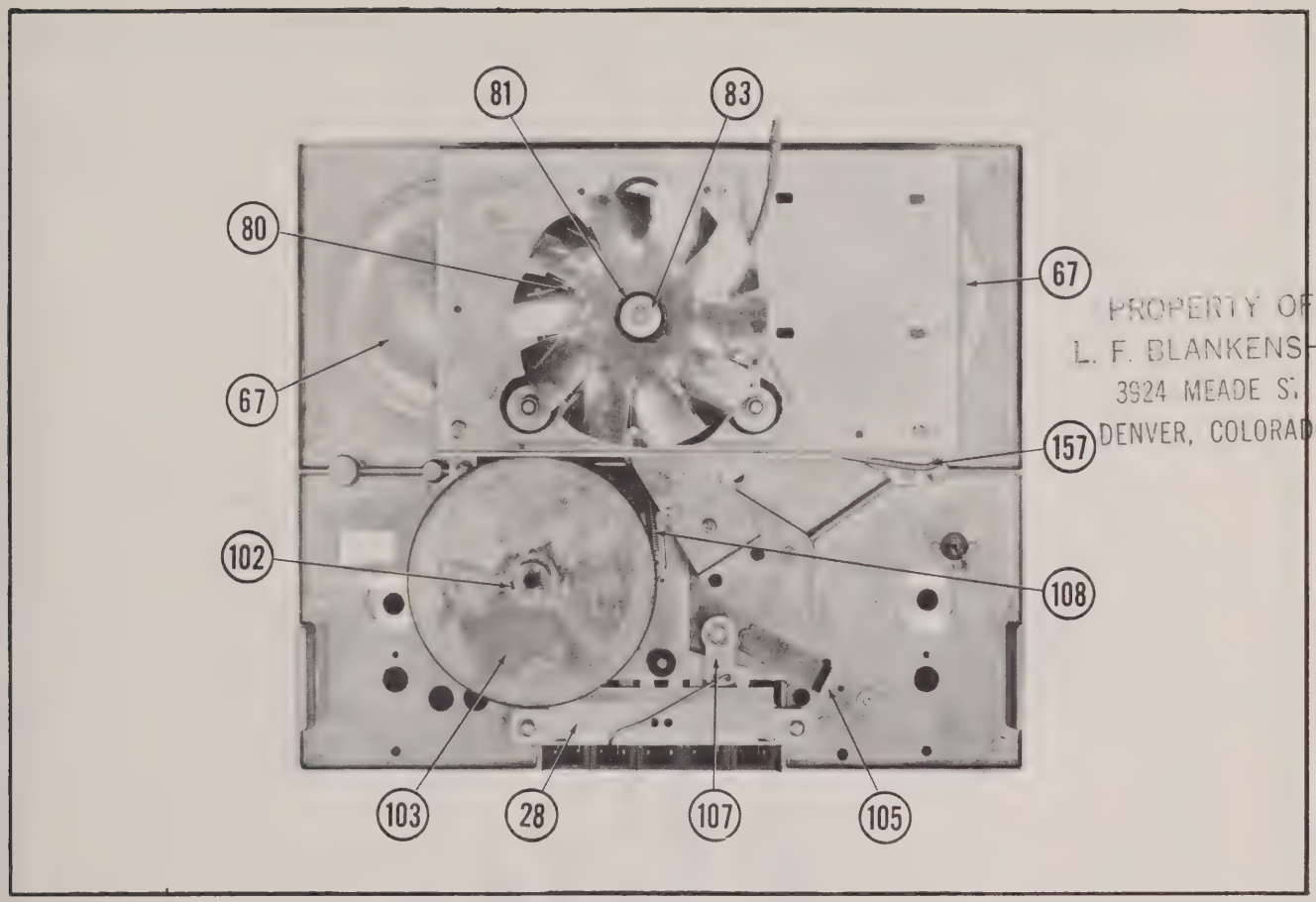

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Figure 2

ment is required only if a bulb is replaced. The two neon indicators are adjusted for correct firing level by means of two trimmer capacitors, one for each indicator. Adjust as follows:

1. Turn recorder on and depress "Record" button.

2. Connect a short jumper lead across the bias oscillator coil, L1, to disable the oscillator.

3. Connect an audio oscillator, set at 1000 cycles, into the microphone input jack. Output of the audio oscillator should be approximately .01 volt. (A 1 volt output may be used with a 100 to 1 resistor reduction pad inserted between the audio oscillator and the Microphone jack).

4. Connect low capacity type AC VTVM to test point "B" (Junction of two 330K resistors, R28 and R29, mounted on a terminal strip near the volume control).

5. Adjust volume control to obtain a reading of 36 volts on the VTVM and leave control set and VTVM connected.

6. Disconnect shorting jumper from across bias oscillator coil.

7. Adjust "Normal" trimmer (C14) fully clockwise and then turn slowly counterclockwise so that upon loosening the trimmer the "Normal" bulb barely lights. This adjustment must be made loosening the trimmer.

8. Again short out the bias oscillator coil and increase the volume control until a reading of 88 volts is obtained on the VTVM.

9. Remove short from bias oscillator coil.

10. Adjust the "Overload" trimmer (C15) as in step 7 to just barely light the "Overload" indicator bulb.

IMPORTANT: Do not adjust the recording bias oscillator after setting the indicator light adjustments.

TROUBLES

Push Buttons Fail To Latch In Position:

Lock plate spring (27) loose or broken, resulting in lock plate (28) not being held against hinge bracket (26).

Fails To Erase:

1. Spring (57) loose or broken, not pulling the erase head forward against the tape.
2. Erase head not properly aligned. See "Erase Head Adjustment").

No Fast Forward Or Reverse:

1. Idler lever tension spring (90), may be loose or broken, not actuating idler lever.

2. Check drive belt (100) to see if it is properly

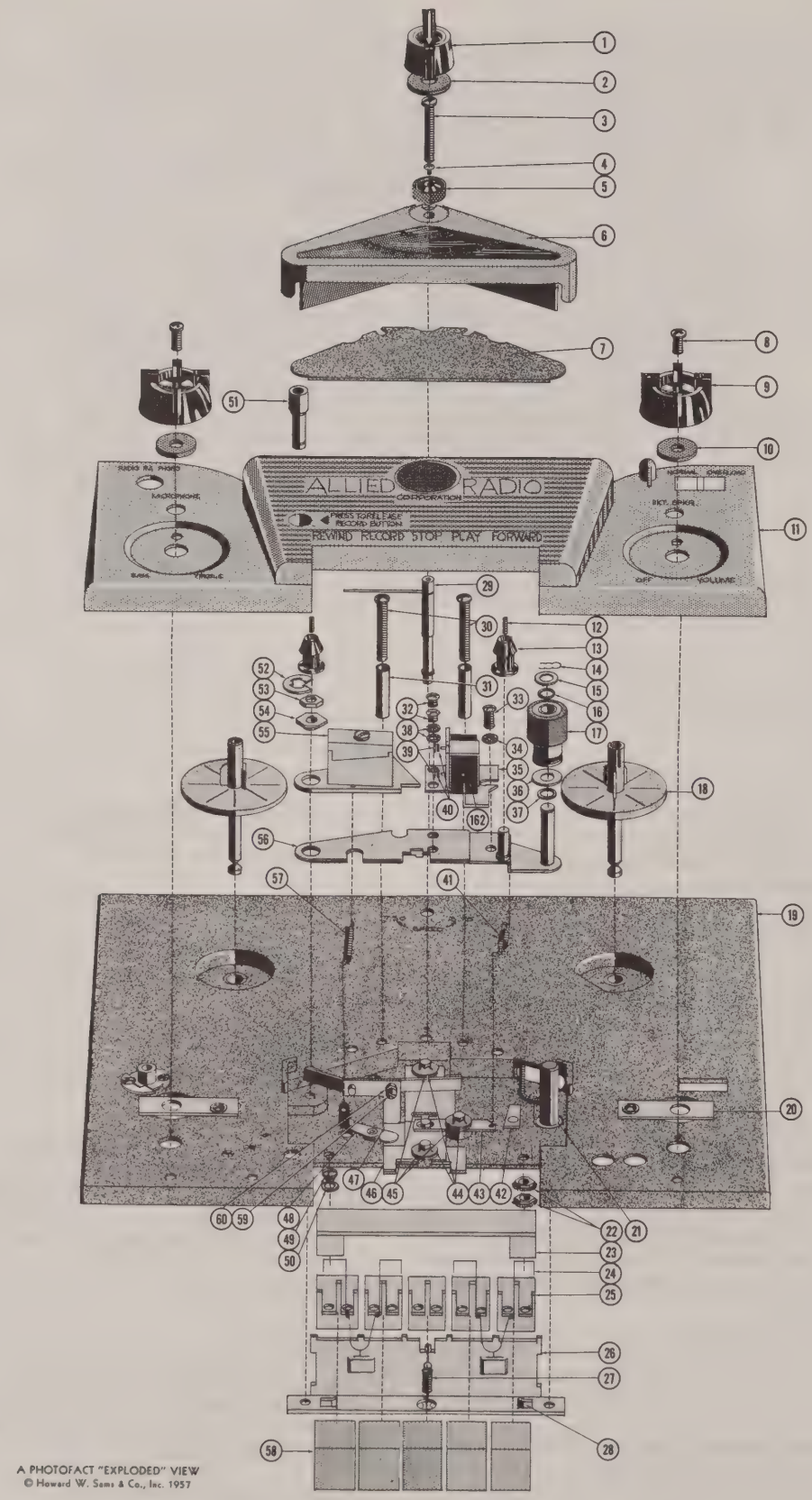


Figure 3A. Exploded View Of Parts Above The Baseplate

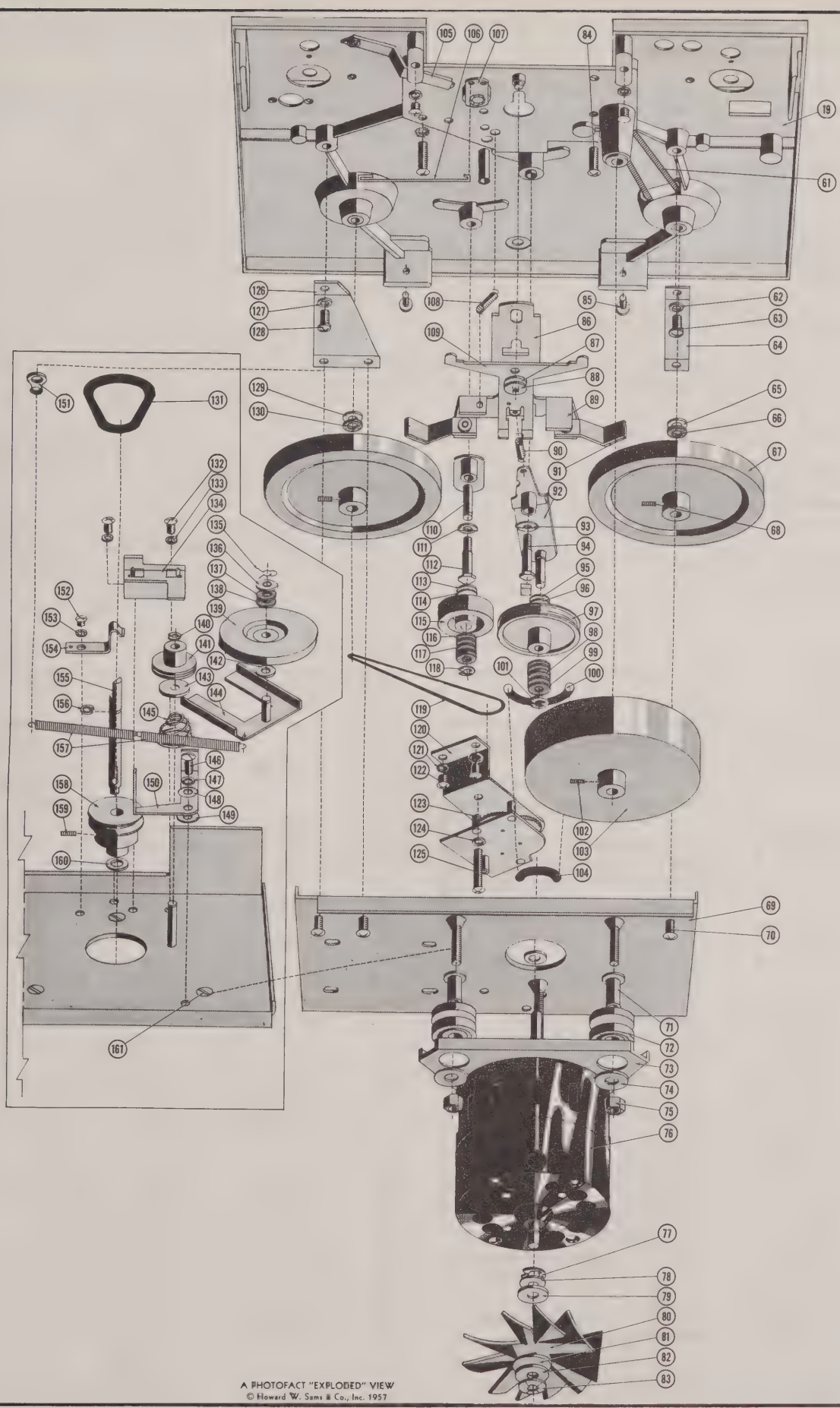


Figure 3B. Exploded View Of Parts Below The Baseplate

connected.

No Drive On Record Or Playback:

1. Idler tension spring (157) loose or broken, thereby not holding idler wheel (139) in proper contact with motor pulley (158) and flywheel (103).

2. Idler slide plate (144) binding on slide bushing (141) preventing idler wheel (139) from moving forward.

Tape Fails To Wind On Take-Up Reel During Record Or Playback:

1. Reel drive spring (61) loose or broken. See "Adjustment For Slow Take-Up Reel".

2. Brake drum shaft (Part of 18) binding. Clean foreign matter from bearing surface and lubricate.

Speed Variation Or WOW:

1. Check capstan (21), pinch roller (17), idler wheel (139), flywheel (103) and motor pulley (158) for foreign matter or oil on the driving surfaces. Clean these parts with a good cleaning fluid.

2. Check motor pulley (158) to see if it is secured to motor shaft.

3. Check idler tension spring (157) for holding idler wheel in firm contact with motor pulley (158) and flywheel (103).

4. Idler slide plate (144) binding on slide bushing (141) preventing idler wheel (139) from making positive contact with motor pulley and flywheel.

CLEANING

The capstan (21) record head (162) and pressure roller (17) are subject to an accumulation of tape coating residue, which is worn off the tape when it passes these parts. Use a soft cloth and alcohol to clean these parts.

CAUTION: Do not use a brush or metal object to clean the recording head as this could mar the metal pole piece.

LUBRICATION

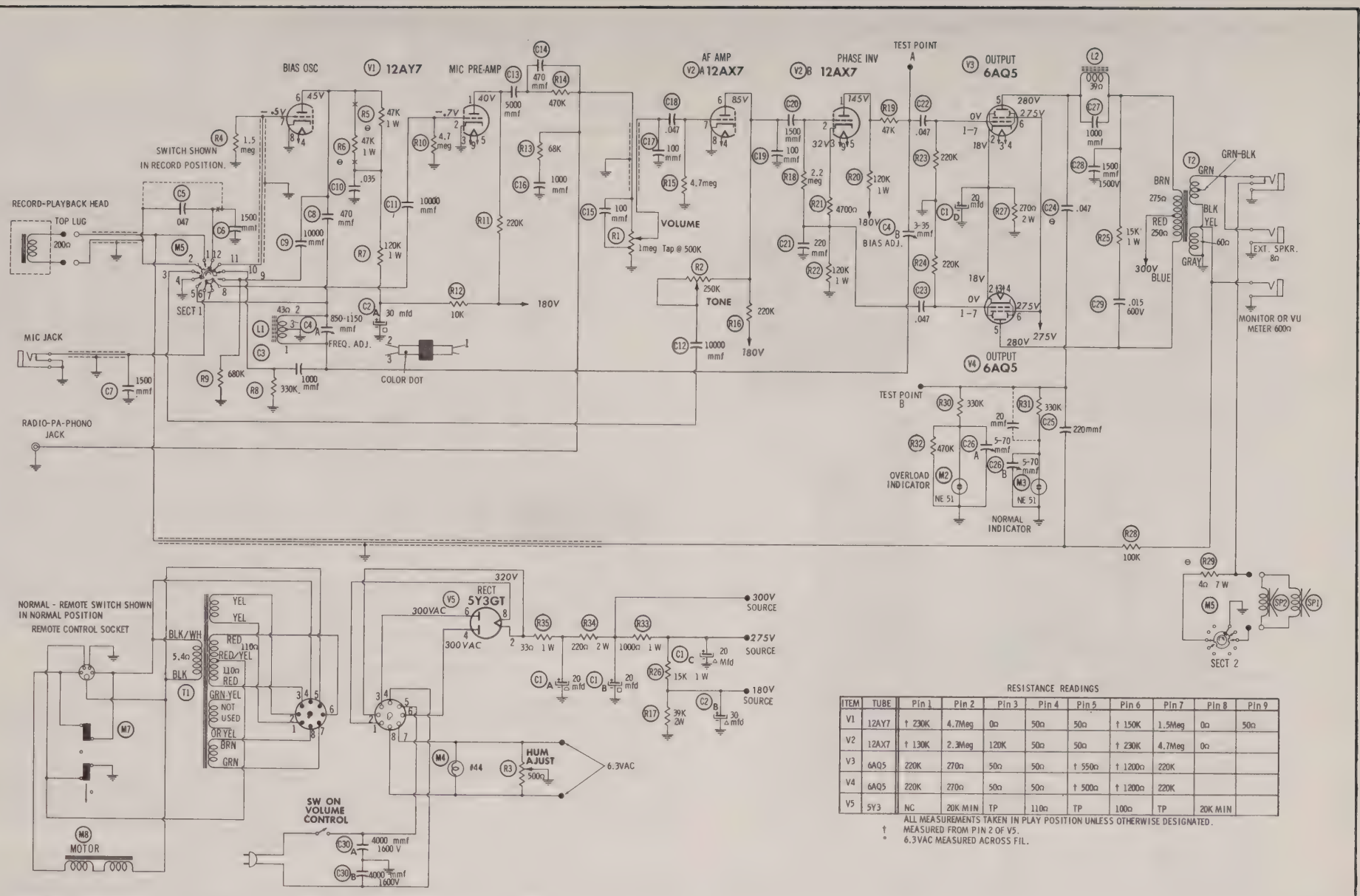
All rotating parts are provided with generous size oilite bearings, which are factory lubricated and requires no further attention.

An occasional cleaning out of foreign matter under the plastic pushbutton cover is desirable, and a small drop of oil on the sliding lever members is advisable.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	C-130253	Speed Shift Knob, Maroon
2	73-2254-3	Felt Washer
3		Screw #6-32 Phillips RHMS
4		Screw #4-36 Phillips OHMS
5	B-32.302-2	Timer Knob
6	D-13.292-2	Rear Escutcheon, Silver
7	B-19.975-3	Rear Escutcheon Plate, Gray
8		Screw #8-32 Phillips RHMS (2 Used)
9	C-13.254-13	Control Knobs, Gray
10	73-2254-3	Felt Washer (2 Used)
11	E-13.293-5	Front Escutcheon, Silver
12		#6-32 Bristol Head Set Screw (2 Used)
13	B-32.309	Tape Guide Post (Right)
	B-32.300D	Tape Guide Post (Left)
14	B-33.409	Hairpin Clip
15	73-2340	Linen Washer
16		Steel Washer
17	B-33.404E	Pinch Roller
18	B-13.262-8	Reel Pan (2 Used)
19	D-35.807-6G	Base Plate Assembly, Gray
20	B-19.985-1A	Jack Mounting Bracket (2 Used)
21	B-32.259-1G	Capstan Shaft
22	48-2219-1	#6-32 Hex. Nut (2 Used)
23	B-19-858	Push Button Retainer Bracket
24	B-31.337-B	Push Button Return Spring (2 Used)
25	B-19.876-D	Push Button Lever (5 Used)
26	B-19.859-1J	Hinge Bracket For Push Buttons
27	B-31.343-A	Lock Plate Spring
28	B-19.870-C	Push Button Lock Plate
29	35-851	Timer Shaft And Pointer Assembly

Ref. No.	Part No.	Description
30		Screw #6-32 Phillips RHMS
31	B-33.446	Spacer (2 Used)
32		Screw #6-32 RHMS (2 Used)
33		Screw #6-32 RHMS
34	73-2231-4	#6 Lockwasher, Int.
35	B-35.854	Head Mounting Bracket Assy.
36	73-2340	Linen Washer
37		Steel Washer
38	73-2231-4	#6 Lockwasher, Int. (2 Used)
39		#2-56 Hex Nut, C.P. (2 Used)
40	73-2233-1	#2 Int. Lockwasher (2 Used)
41	B-31.336-F	Pinch Roller Tension Spring
42	B-19.884-B	Hold Down Bracket
43	B-19.881-C	Playback Actuating Lever
44	B-33.412	Push-On Stud Nut, 3/16 Stud (3 Used)
45	73-2241-148F	Flat Washer
46	B-19.868A	Record Slide Plate
47	B-35.758	Playback Slide Plate Assy.
48	B-35.766-C	Record Actuating Lever Assembly
49		Screw #6-32 BHMS, Phillips
50	73-2231-4	#6 Int. Lockwasher Stl. C.P.
51	B-32.308-4	Record Lock Release Button
52	33.415	"E" Retaining Ring
53	48-1C-13-1	#6-32 Hex Nut, Steel C.P.
54	B-32.260-D	Tape Guide Post Spacer
55	B-35.794	Erase Head And Plate Assy.
56	B-35.824-B	Pinch Roller Plate Assembly
57	B-31.347-B	Erase Head Tension Spring
58	B-35.755-5	Push Button Assembly, Gray (5 Used)
59		#6-32 RHMS Steel C.P.
60	48-410-1	#6-32 Locknut
61	B-31.351A	Reel Drive Spring (Tension)
62	73-2231-5	#8 Int. Lockwasher



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AY7	† 230K	4.7Meg	0Ω	50Ω	50Ω	† 150K	1.5Meg	0Ω	50Ω
V2	12AX7	† 130K	2.3Meg	120K	50Ω	50Ω	† 230K	4.7Meg	0Ω	
V3	6AQ5	220K	270Ω	50Ω	50Ω	† 550Ω	† 1200Ω	220K		
V4	6AQ5	220K	270Ω	50Ω	50Ω	† 500Ω	† 1200Ω	220K		
V5	5Y3	NC	20K MIN	TP	110Ω	TP	100Ω	TP	20K MIN	

ALL MEASUREMENTS TAKEN IN PLAY POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM PIN 2 OF V5.
° 6.3VAC MEASURED ACROSS FIL.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

372-8

KNIGHT
MODELS 99RZ177, 99RZ936

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Bias Osc & Mic. Preamp.	12AY7	
V2	AF Amp. & Phase Inv.	12AX7	
V3	Output	6AQ5	
V4	Output	6AQ5	
V5	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	450		AFH4-67	D0520	FP444	TMQ-83	Q-340	TVL-4724.2
B	■20	450							
C	▲20	450							
D	20	25							
C2A	■30	250		AFH2-27	B0220	FP135 TC58	TMD-25	D110 MTD-U510	TVL-2517
B	▲30	250							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

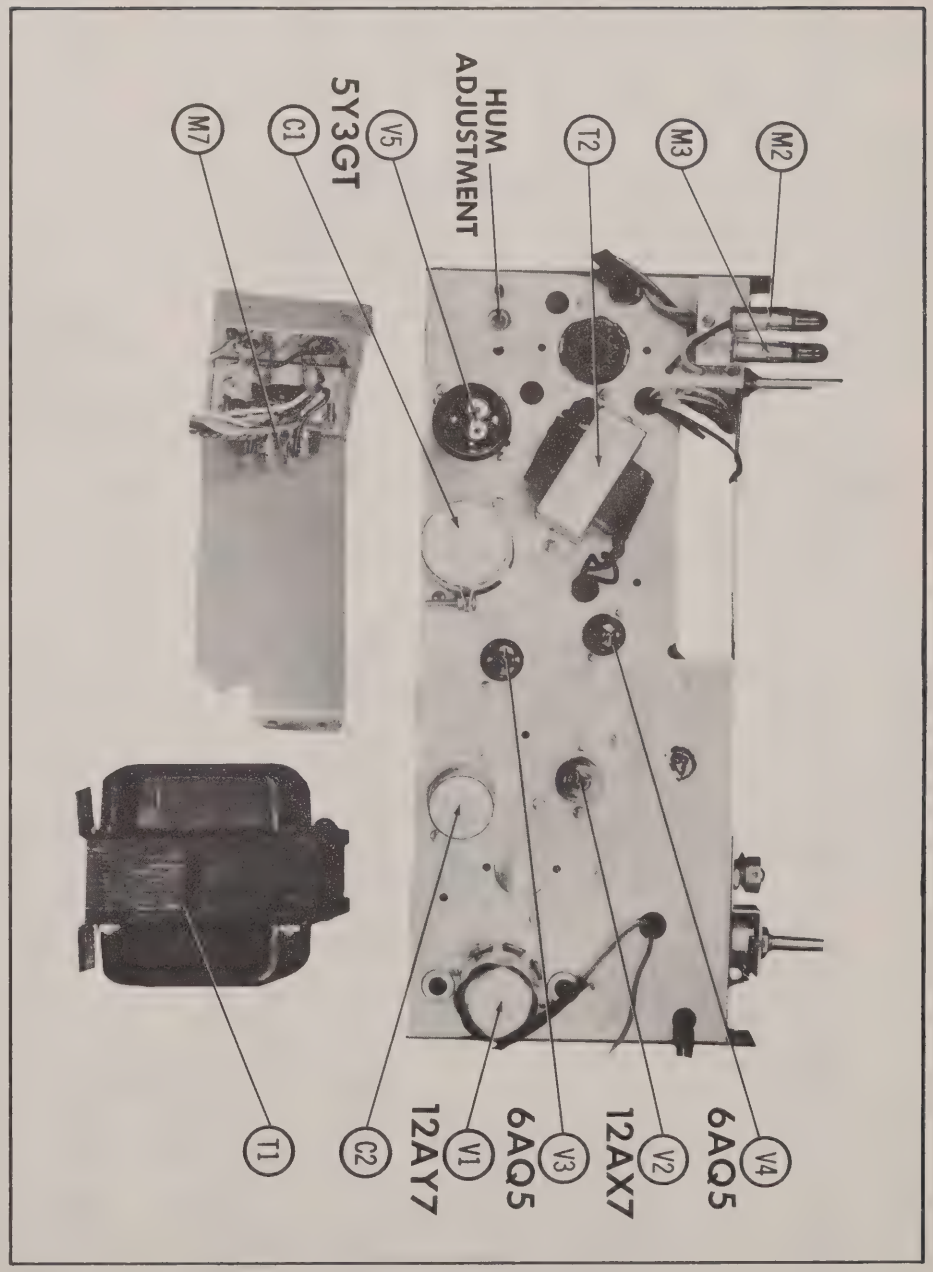
ITEM No.	RATING CAP.	RATING VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	1000		C-4.109-9	SI1000	D6-102	LT6T1	GP-1000	UC-521	5GA-D1	
C4A	850-1150		C-4.142							Dual
B	3-35									
C5	.047	200	D-4.148-91	BPD-05	DF-503	CUB4S47		GEM-4147	2TM-S47	
C6	1500		C-4.109-13	SI1500	D6-152	LT6D15	GP-1500	UC-5215	5GA-D15	
C7	1500		C-4.109-13	SI1500	D6-152	LT6D15	GP-1500	UC-5215	5GA-D15	
C8	470		C-4.109-2	SI470	D6-471	LT6T47	GP-470	UC-5347	5GA-T47	
C9	10000		C-4.115-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	.035	400	D-4.148-56							
C11	10000		C-4.115-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C12	10000		C-4.115-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C13	5000		C-4.115-18	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C14	470		C-4.109-2	SI470	D6-471	LT6T47	GP-470	UC-5347	5GA-T47	
C15	100		C-4.109-10	SI100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C16	1000		C-4.109-9	SI1000	D6-102	LT6D1	GP-1000	UC-521	5GA-D1	
C17	100		C-4.109-10	SI100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C18	.047	200	D-4.148-91	BPD-05	DF-503	CUB4S47		GEM-4147	2TM-S47	
C19	100		C-4.109-10	SI100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C20	1500		C-4.109-13	SI1500	D6-152	LT6D15	GP-1500	UC-5215	5HK-D15	
C21	220		C-4.109-27	NPO-SI220	D6-221	L10T22			MS-322	10%
C22	.047	400	D-4.148-91	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C23	.047	400	D-4.148-91	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C24	.047	400	D-4.148-91	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	①
C25	220		C-4.109-27	NPO-SI22	D6-221	L10T22			MS-322	10%
C26A	5-70		B-4.145							Dual
B	5-70									
C27	1000		D-4.104-88	1464-001		1R5D1			MS-21	10%
C28	1500	1500	B-4 129-7	HVD-15-1500	DD30-152	HVC16D15	HD15-1500	DC30215		
C29	.015	600	D-4.148-87	BPD-015	DD16-153	CUB6S15	ED-015	GEM-6115	6TM-S15	
C30A	4000	1600	B-4.131-1			HVE16D4				Dual
B	4000	1600				HVE16D4				

① Some versions use a .035 capacitor @ 600V in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	C-8.227-2	BT-71	A47F5-1Meg	Q19-137X	UT-443	Volume Tap @ 500K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	250K	½	C-8.231-1	B-50	A47-250K-S	Q11-130	U46	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	500Ω	½	C-8.207-7	AB-4	A47-500-S	Q11-103	U2	Hum Adjust
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R4	1.5Meg			BTS-1.5Meg	
R5	47K	1		BTA-47K	Note 1
R6	47K	1		BTA-47K	Note 1
R7	120K	1	D-7.102-112	BTA-120K	
R8	330K		D-7.101-121	BTS-330K	
R9	680K		D-7.101-134	BTS-680K	
R10	4.7Meg			BTS-4.7Meg	
R11	220K		D-7.101-114	BTS-220K	
R12	10K		D-7.101-58	BTS-10K	
R13	68K		D-7.101-93	BTS-68K	
R14	470K		D-7.101-128	BTS-470K	
R15	4.7Meg		D-7.101-178	BTS-4.7Meg	
R16	220K		D-7.101-114	BTS-220K	
R17	39K	2	D-7.103-153	BTB-39K	
R18	2.2Meg		D-7.101-155	BTS-2.2Meg	
R19	47K		D-7.101-86	BTS-47K	
R20	120K	1	D-7.102-112	BTA-120K	
R21	4700Ω		D-7.101-44	BTS-4700	
R22	120K	1	D-7.101-112	BTA-120K	
R23	220K		D-7.101-114	BTS-220K	
R24	220K		D-7.101-114	BTS-220K	
R25	15K	1	D-7.102-72	BTA-15K	
R26	15K	1	D-7.102-72	BTA-15K	
R27	270Ω	2	53-2825	BTB-270	
R28	100K		D-7.101-100	BTS-100K	
R29	4	7		PW7-4	Note 2
R30	330K		D-7.101-121	BTS-330K	
R31	330K		D-7.101-121	BTS-330K	
R32	470K		D-7.101-128	BTS-470K	
R33	1000Ω	1	D-7.102-23	BTA-1000	
R34	220Ω	2	D-7.103-58	BTB-220	
R35	33Ω	1	D-7.102-227	BTA-33	

Note 1. Some versions may use a single 22K 1 Watt resistor.
Note 2. Some versions may use a 3.3Ω 7 Watt resistor.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.59A	600VCT @.075A	5V @2A	D-9278-0	P9304 ②				22R04 ① ②	
	SEC. 3	SEC. 4	SEC. 5			* This Winding Not Used. ① Use Universal Mtg. Bracket. ② Tape Center Tap On 6.3V Winding.				
	6.3V @1.8A	6.3V * @.0A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7900Ω CT	3-4Ω CT SEC. 2 600Ω	C-9277-B						* Note - Center Tap Not Used.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		KNIGHT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Bias Osc.	B-1.557				8.5 Millihenries
L2	Trap Coil	B-1.556				8.2 Millihenries

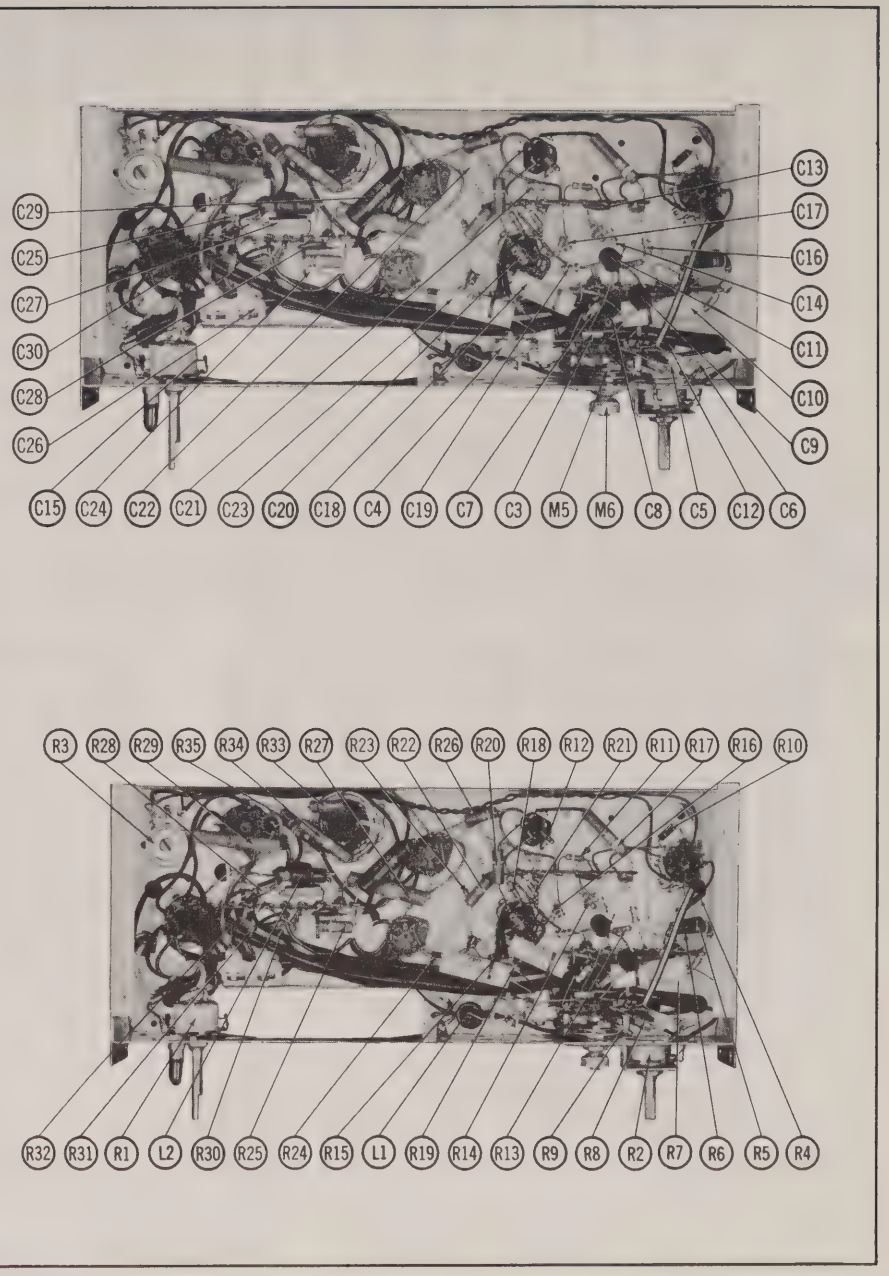
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	KNIGHT PART No.	QUAM PART No.	
SP1	5" x 7"	PM	6-8Ω	30-341-2	57A1Z6	
SP2	5" x 7"	PM	6-8Ω	30-341-2	57A1Z6	

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Erase Head Assy.	B-35.794	
M2	Indicator Light	45-2036-1	Neon
M3	Indicator Light	45-2036-1	Neon
M4	Pilot Light		#44
M5	Switch	B-11.247	Function - (Rotary Wafer Type)
M6	Switch Lever Assy.	B-35.859-1	
M7	Switch		Normal - Remote (Slide Type - DPDT)
M8	Motor		

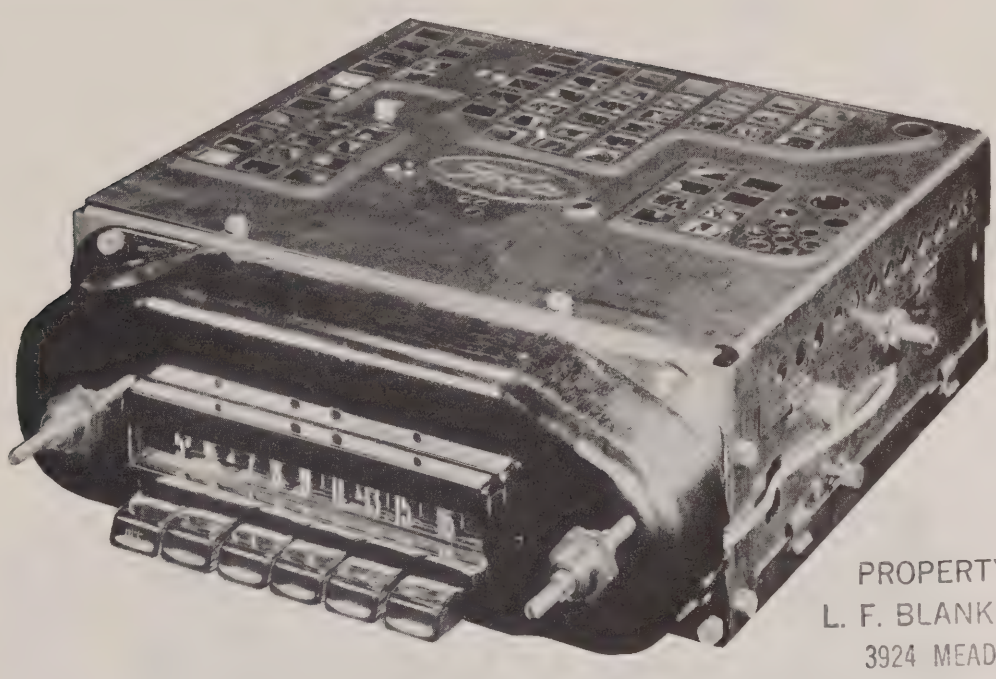
CHASSIS—BOTTOM VIEW



MECHANICAL PARTS LIST (CONTINUED)

Ref. No.	Part No.	Description
63		#8-32 Screw, RHMS Phillips
64	B-19.862C	Angle Bracket For Mounting Drive Assembly
65	B-28.163	Linen Washer
66	73-2241-134	Flat Washer (1 or 2 Used)
67	C-35.823-1E	Brake Drum And Bushing Assembly (2 Used)
68		#8-32 BHM Screw (2 Used)
69	D-35.753-1	Drive Mounting Plate
70		#8-32 BHM Screw
71		Spacer, Motor Mounting (Part of Item 72)
72	B-28.159	Shock Mount
73	C-19.837-F	Motor Adapter Plate
74	B-33.411-A	Flat Washer
75	48.409-1	Hex Nut
76	D-36.153-E	Motor, Round Type (Fasco)
	D-36.154G	Motor, Square Type (GI and Alliance)
77	B-33.418	Truanc Retaining "E" Ring
78	73.2241-143	Flat Washer
79	73-2254-3	Felt Washer
80	C-119.887-1	Fan Blade
81	73-2254-3	Felt Washer
82	73-2241-143	Flat Washer
83	33.415	Push-On Fastener (Presthole)
84		#8-32 RHM Screw, Phillips (2 Used)
85		#8-32 RHM Screw, Phillips (2 Used)
86	C-35.835	Brake Slide Plate Assembly
87	B-28.163	Linen Washer
88	B-33.412	Push-On-Stud Nut, 3/16" Stud
89	B-35.764	Pressure Pad Spring Assy.
90	B-31.339-C	Idler Lever Tension Spring
91	B-31.335A	Brake Pad, Felt (2 Used)
92	B-35.834-2	Idler Lever Assembly
93		Bent Washer
94	B-32.275-1E	#8-32 HH Shoulder Screw
95	28.173	Phenolic Washer
96	28.173	Phenolic Washer
97	B-33.406-D	Idler Drive Sheave
98	73-2254-6	Felt Washer (1 or 2 Used)
99	73-2241-150	Steel Washer (1 or 2 Used)
100	B-28.181	Idler Drive Belt
101	B-33.418	Truarc Retaining "E" Ring
102		#8-32 BHS Screw
103	C-13.257-1C	Flywheel
104	B-28.181	Idler Drive Belt
105	B-35.774	Record Interlock Assembly
106	B-31.333	Switch Arm Link
107	B-35.859-1	Switch Lever Assembly
108	B-31.338-B	Brake Return Spring
109	B-35.759-1	Shift Plate Assembly
110	B-35.757D	Sub Idler Plate Assembly
111		Bent Washer
112	B-32.275-1E	#8-32 HH Shoulder Screw
113	28.173	Phenolic Washer
114	28.173	Phenolic Washer
115	B-35.405-F	Sub Idler
116	73-2254-6	Felt Washer (1 or 2 Used)
117	73-2241-150	Flat Washer, Steel (1 or 2 Used)
118	B-33.418	Truarc Retaining "E" Ring
119		Timer Drive Belt
120	D-33.445	Gear Train Mounting Bracket, Tape Index
121	73-2331-4	#6 Int. Lockwasher
122		#6-32 Phillips RHM Screw
123	D-33.445-A	Tape Index Gear Train
124	73-2331-4	#6 Int. Lockwasher
125		#6-32 Phillips RHM Screw
126	B-19.863	Drive Mounting Plate Bracket
127	72-2231-5	#8 Int. Lockwasher
128		#8-32 RHM Screw, Phillips
129	B-28.163	Linen Washer
130	73-2241-143	Flat Washer, Steel (1 or 2 Used)
132		#6-32 Phillips RHM Screw (2 Used)
133	73-2231-4	#6 Int. Lockwasher
134	51-3182	Shift Plate For Fast Speed
135	B-33.409	Hairpin Clip
136	73-2241-150	Steel Washer (1 or 2 Used)
137	B-28.163	Linen Washer (1 or 2 Used)
138	73-2238-49	Phenolic Washer (1 or 2 Used)
139	B-33.408C	Rubber Bonded Idler Wheel 2 1/2" Dia.
140	B-33.407-1	"C" Washer
141	B-32.264-F	Idler Slide Bushing
142	B-28.163	Linen Washer
143		Steel Washer
144	B-35.768-A	Idler Slide Plate Assembly
145	B-31.327-D	Idler Lift Spring
146		#8-32 RHM Screw
147	73-2241-150	Steel Washer
148	B-32.291-1	Shoulder Washer
149		Steel Washer
150	110-47	Idler-Throw-Out-Lever
151		Idler Tension Spring Clip
152		#6-32 RHM Screw, Phillips
153	73-2231-4	#6 Int. Lockwasher
154	B-19.961	Speed Control Shaft Detent Spring
155	C-35.816-1	Speed Control Shaft Assembly
156	33.469	Truarc Retaining Ring
157	B-31.324-A	Idler Tension Spring (2 Used)
158	B-32.288-D	Motor Drive Pulley
159		#8-32 B.H.S. Screw
160	73-2238-49	Phenolic Washer
161		Motor Mounting Screw (3 Used)
162	C-36.156-E	Tape Recording Head/Shure TR16A

MERCURY
MODEL 77BM (FEK-18805-C)



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MERCURY
MODEL 77BM (FEK-18805-C)

TRADE NAME	Mercury Model 77BM (FEK-18805-C) (For 1957 Mercury Automobiles)
MANUFACTURER	Bendix Radio, Div. of Bendix Aviation Corp., Baltimore 4, Maryland
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Seven)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12AU6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., (2) 12AB5 Output, 12X4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 3.8 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Tone control to normal.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262.5KC (400%Mod)	High Freq. end stop.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle.	1605KC	"	"	A5, A6, A7	"
3.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum volume.						
	The following steps are not necessary unless tuner cores have been tampered with or replaced. Back tuning cores (A8, A9, A10) out of coils, but not out of coil forms.						
4.	Fig. 1	Thru dummy to antenna receptacle.	1605KC	High Freq. end stop.	Across voice coil	A5, A6, A7	"
5.	"	"	1000KC	Move carriage ½" from high freq. end stop.	"	A8, A9, A10	Adjust for maximum output. Repeat steps 4 and 5 until no further increase in output is obtained.

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station and press pushbutton in firmly.
3. Repeat on remaining pushbuttons.

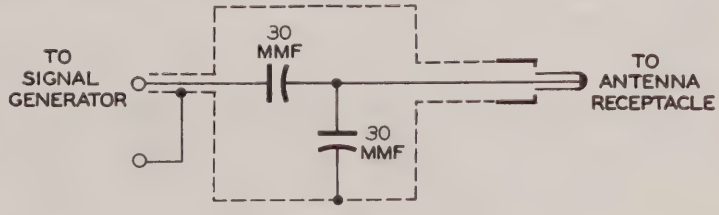
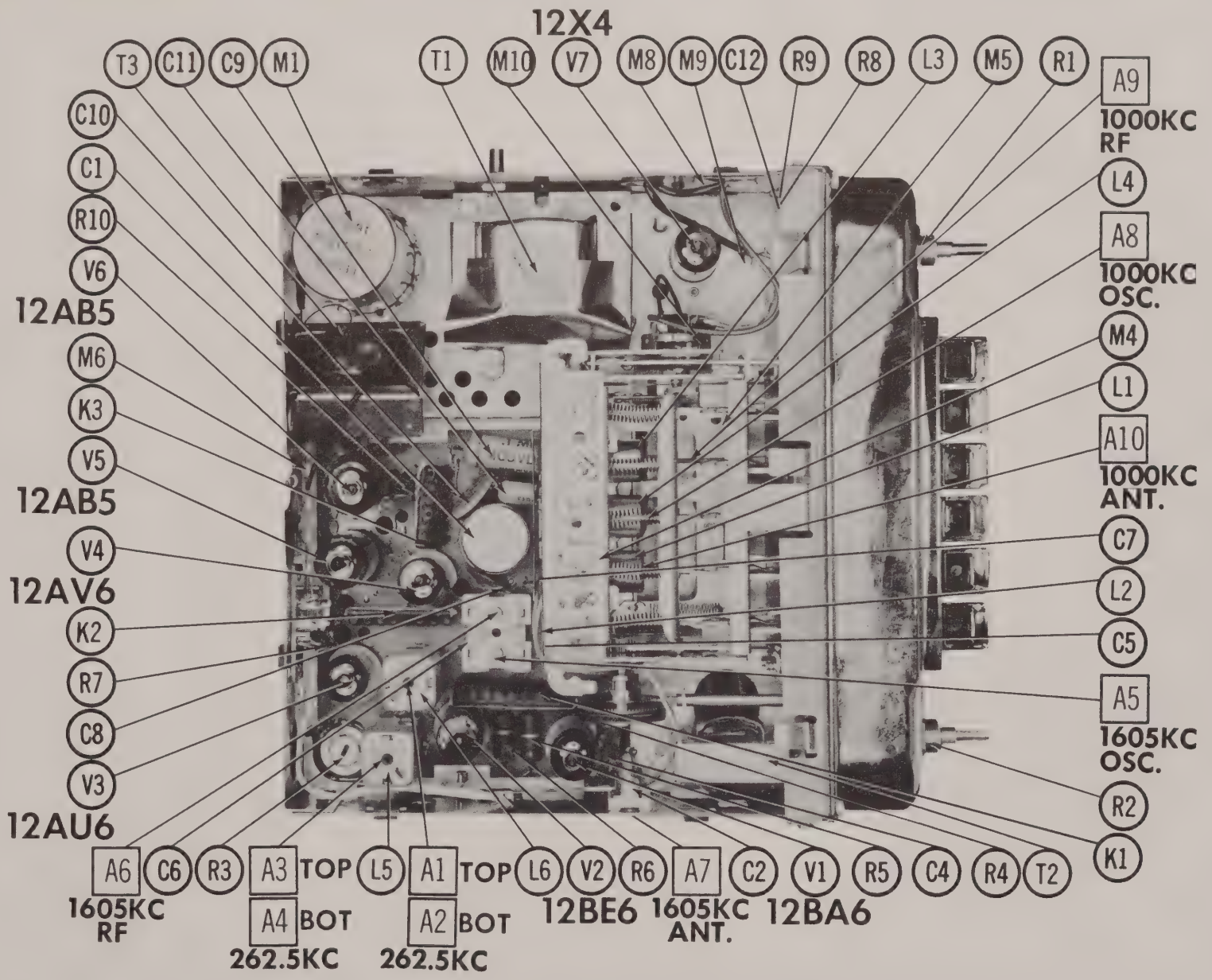


FIG. 1

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12AU6	
V4	Det.-AVC-AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V5	Output	12AB5	
V6	Output	12AB5	
V7	Rectifier	12X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BENDIX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	350	220353-3	AFH3-107	CO800	FP329.5	TMT-92	T-470	TVL-3635
B	■20	300							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	BENDIX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	4-75		219083-1							
C3	120		220348-407	NP0-SI 120	TCZ-120	C10T12C	TCO-120		5TCC-T12	5% N150
C4	100		2090058N-101M							
C5	.1	400	2090059C-104Z	P488N-1	DF-104	CUB4P1		GEM-401	6TM-P1	
C6A	120-450		219092-2							
B	100									
C	370-445									
C7	.05	200	2090059B-503M	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C8	15000		220332-7	BPD-015	DD16-153	BYA10S15	ED-015		5HK-S15	
C9	.1	400	2090059C-104Z	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C10	20000		220332-6	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C11	.022	400	2090059C-223K	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C12	.015	200	220098-52	BPD-015	DD16-153	CUB6S15	ED-015	GEM-4115	4TM-S15	
C13	.03	1000	2090059E-303K	P1088N-03		CUB10S3		GEM-1013	10TM-S3	
C14	.5	100	2090059A-504X	P288N-5		CUB2P5		GEM-205	2TM-P5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	Switch		219689-2					
B	250K	½						Tone
R2	11.5Ω	2	219679-1		RTV-572-C			Volume - Tap @ 75K
R3	3000Ω	2	219682-1					Fader
								Sensitivity

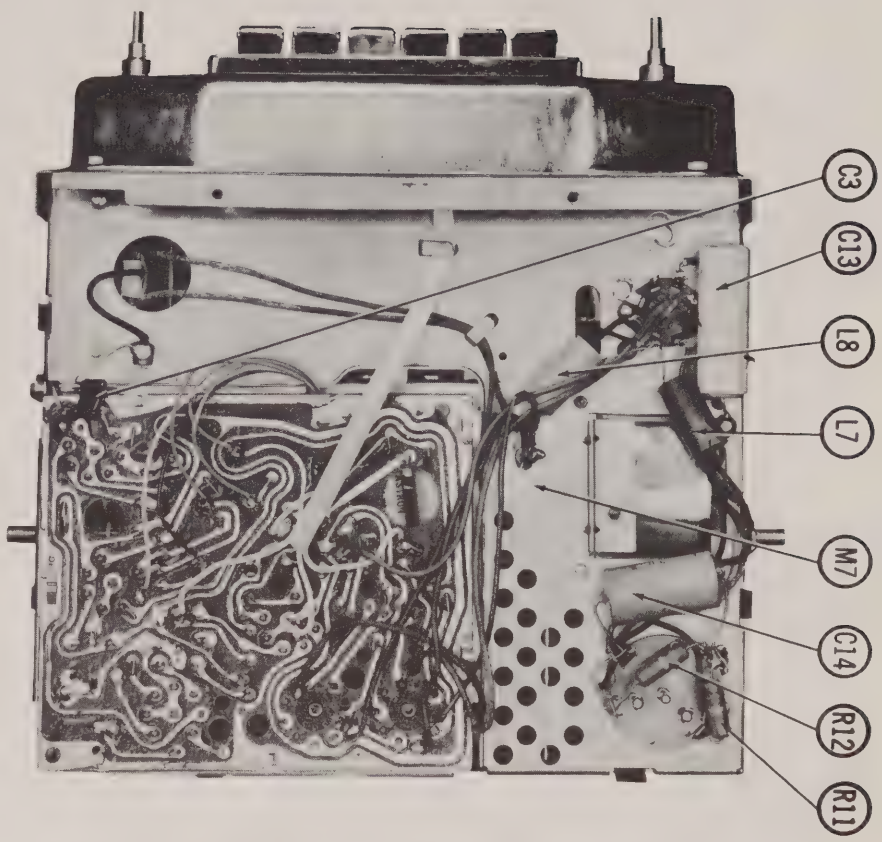
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BENDIX PART No.	IRC PART No.	
R4	1Meg		220604B-105	BTS-1Meg	
R5	15K	2	220604D-153	BTB-15K	
R6	15K	2	220604D-153	BTB-15K	
R7	180Ω		220604B-181	BTS-180	
R8	27K		220551B-273K	BTS-27K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BENDIX PART No.	IRC PART No.	
R9	4700Ω		220551B-472K	BTS-4700	
R10	68K		220604B-683	BTS-68K	
R11	180Ω	1	220551C-181K	BTA-180	
R12	180Ω	1	220551C-181K	BTA-180	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	BENDIX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @ 2.3A	540VCT @ .065A			282975-3	V3903	P-2978	P-6489	22R52	V-31

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	BENDIX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2:	1	2090075-2	A2504 ②③	A-3010 ①		20A16 ②		① Use original channel mounting frame. ② Connect as autoformer. ③ Drill new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	BENDIX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	9700Ω CT	3-4Ω	291798-5	Z1000	A-2938	A-3850	24S60	S-17X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	BENDIX PART No.	QUAM PART No.	
SP1	6"x9"	PM	3-4Ω	N2220099-1 282634-6 ①	69A2 69A2	① Alternate part number

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		BENDIX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil					Note 1
L2	RF Trap	2090088-1				50 Microhenries, wound on 180K resistor
L3	RF Coil					Note 1
L4	Osc. Coil					Note 1
L5	Input IF	291791-2	16-6756	BC-344	13-PH1	
L6	Output IF	291820-2		BC-346	13-PH6	
L7	RF Choke	216188-10				
L8	Fil. Choke	216188-5				

Note 1. Part of M5 (included in M4).

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	BENDIX PART No.	REPLACEMENT DATA
K1	Converter Circuit	8.2MMF 10%, 47MMF N750 10%, 47Meg, 47K, 68Ω	2090096-1	
K2	Audio Amp. Circuit	200MMF, 150K, 2.2Meg, 33K, 10Meg	2090097-1	Erie 708
K3	Audio Output Circuit	3000MMF, 330Ω 1W, 660Ω 1W	2090098-1	Erie 706

VIBRATOR

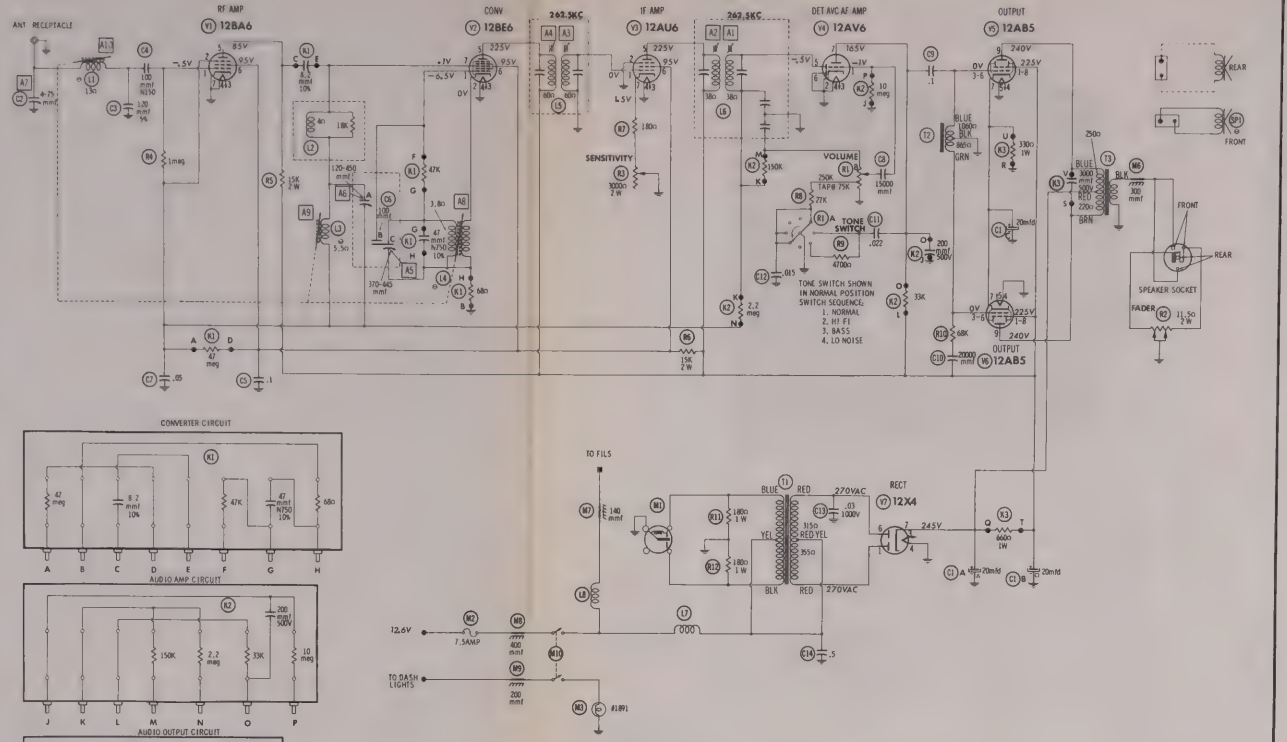
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				BENDIX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115∿	221139-1	6330	G1602/ G883	6330	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BENDIX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	7.5A	AGW-7½A	221634-5	30307.5 (7AG 7½A)	155009	SFE 7½A	HRH

MISCELLANEOUS

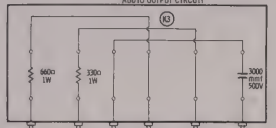
ITEM No.	PART NAME	BENDIX PART No.	NOTES
M3	Dial Light		#1891
M4	Tuner Assy.	2090009-1	Oak - Complete
	Tuner Assy.	221485-1	RCC - Complete
M5	Tuner Coil Assy.	2090131-4	Oak
	Tuner Coil Assy.	2090131-3	RCC
M6	Spark Plate	220267-12	300MMF
M7	Spark Plate	220267-11	140MMF
M8	Spark Plate	220267-6	400MMF
M9	Spark Plate	220267-1	200MMF
M10	Switch	218805-1	On-off



CONVERTER CIRCUIT

AUDIO AMP CIRCUIT

AUDIO OUTPUT CIRCUIT



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

❷ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	3.5Meg	2.5Meg	1.6Ω	0Ω	↑ 15K	↑ 15K	0Ω		
V2	12BE6	47K	.8Ω	1.6Ω	0Ω	↑ 660Ω	↑ 15K	2.5Meg		
V3	12AU6	60Ω	0Ω	1.6Ω	0Ω	↑ 660Ω	↑ 15K			
V4	12AV6	10Meg	0Ω	1.6Ω	0Ω	320K	0Ω	↑ 33K		
V5	12AB5	↑ 660Ω	NC	1060Ω	1.6Ω	0Ω	1080Ω	330Ω	↑ 660Ω	↑ 250Ω
V6	12AB5	↑ 660Ω	NC	865Ω	0Ω	1.6Ω	865Ω	330Ω	↑ 660Ω	↑ 220Ω
V7	12X4	355Ω	TP	1.6Ω	0Ω	NC	315Ω	20K(Min)		

↑ MEASURED FROM PIN 7 OF V7
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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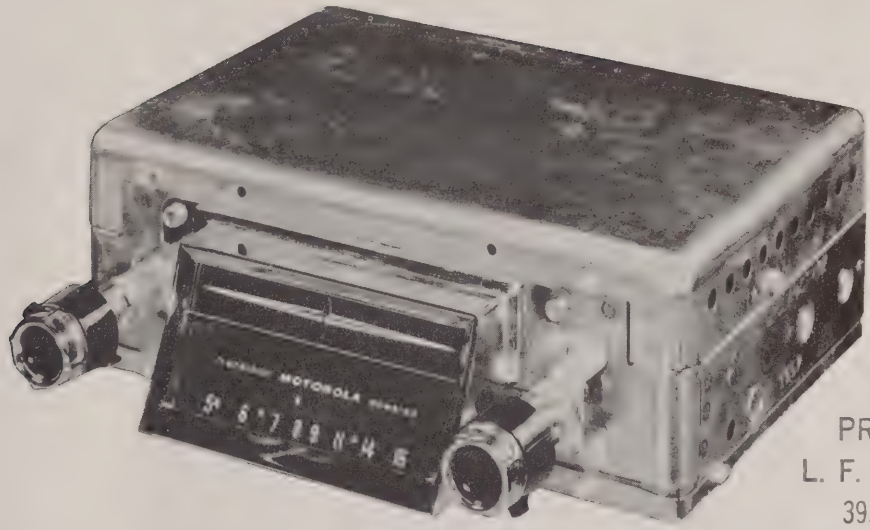

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DENVER, COLORADO

MOTOROLA
MODEL CTM7X

MOTOROLA
MODEL CTM7X

TRADE NAME	Motorola Model CTM7X (For 1957 Chevrolet Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Five)	Types 12DE8 Overload Limiter-RF Amp., 12AD6 Converter, 12AF6 IF Amplifier, 12F8 Det.-AVC-AF Amp., 12K5 Driver
POWER SUPPLY	12 Volt Storage Battery — RATING 1.8 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	535-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis.	455KC (400~ Mod.).	High frequency end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	"	"	A5, A6 A7	"
	The following steps are not necessary unless tuner has been tampered with or associated components have been replaced. Before proceeding back tuner cores (A8, A9, A10) out of coil forms. Alignment tool similar to Fig. 2 may be used.						
3.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	High frequency end stop.	Across voice coil.	A5, A6 A7	Adjust for maximum output.
4.	"	"	1400KC	Back tuning carriage 13/64" from high frequency end stop.	"	A8, A9 A10	"
5.	"	"	1610KC	High frequency end stop.	"	A5, A6 A7	Adjust for maximum output. Repeat steps 4 & 5 making step 5 the last adjustment.
6.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC, adjust A7 for maximum volume.						

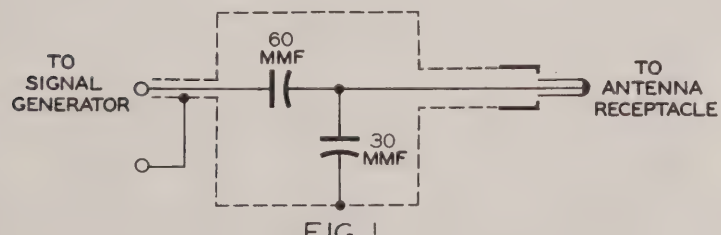

FIG. 1

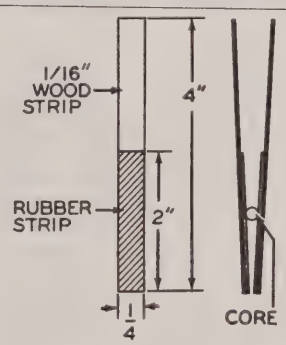

FIG. 2

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Over Load Limiter-RF Amplifier	12DE8	
V2	Converter	12AD6	
V3	IF Amplifier	12AF6	

ITEM No.	USE	TYPE	NOTES
V4	Det.-AVC-AF Amplifier	12F8	
V5	Driver	12K5	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N178	Audio Output	2N155		2N307/2N242	Output Type 2N176 Used In Some Versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■500	16	23B539261	AFH2-02-10	B0045	WP200.5			R2452*
B	▲100	16							

* Non-Catalog Item.

FIXED CAPACITORS

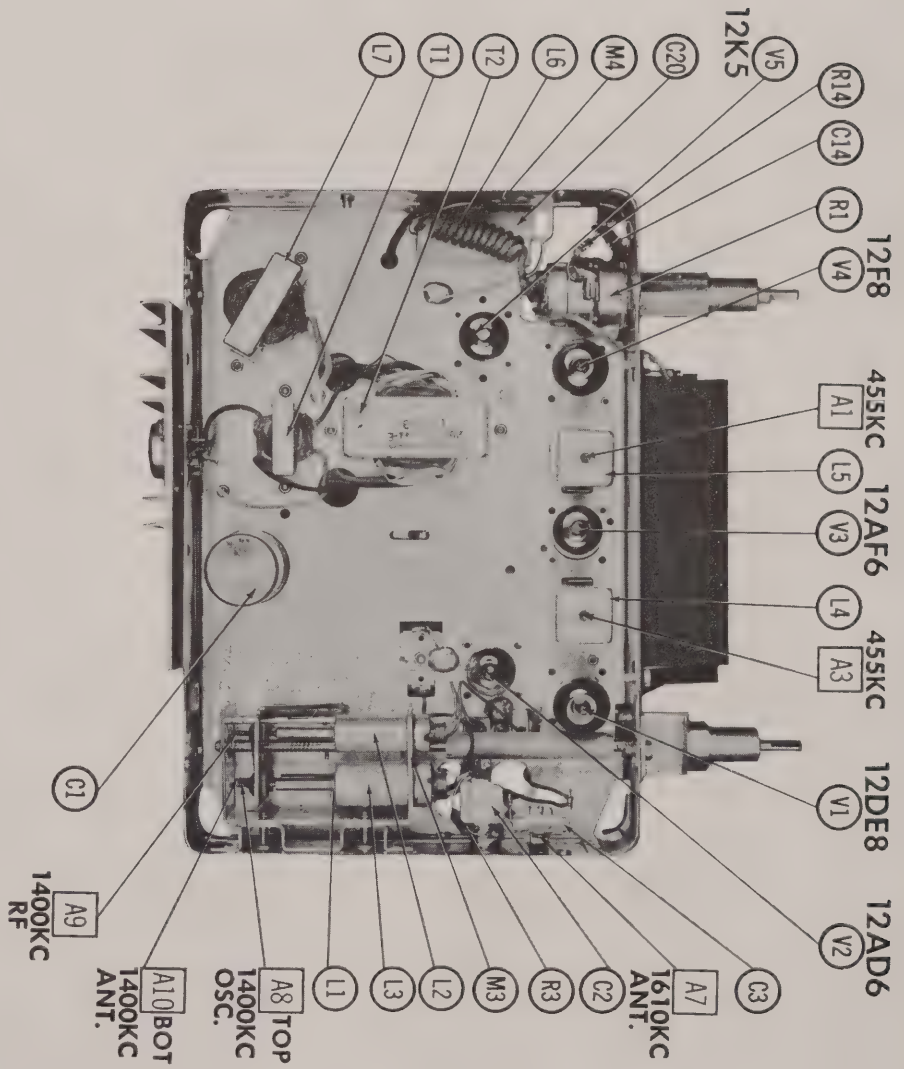
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	90		21A591682							
C3	50-240		20K538742							
C4	12		21R120549	SI12	DD-120	L10Q12	ED-12	UC-5412	5GA-Q12	
C5	.05	200	8R121005	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C6	20-180		20A481526							
C7	4.7		21R115954	NPO-SI4.7	TCZ-4R7	C10V47C	TCO-4.7	ZT-5547	5TCCB-V47	
C8	395-470		20A485708							
C9	47		21R115593	N750-SI47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	N750
C10	.05	200	8R121005	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C11	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C12	27		21R120567		TCN-27	C10Q27U	TC7-27			N750
C13	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C14	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C15	.004	600	8R121000	BPD-004	D6-402	CUB6D4	ED-004	GEM-624	6TM-D4	
C16	.05	200	8R121005	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C17	.1	200	8R121573	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C18	.01	200	8R121868	BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C19	680		21R410124	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C20	.5	100	8K121666	P288N-5		CUB2P5		GEM-205	2TM-P5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	18K541128	F1-41	RTV-637C		UE1473S	Tone
B	1Meg			R2-56				Volume, Tap @ 500K
C	Switch			KB-1				
R2	210Ω	2	18K540718		39-200			Bias Adjust (Wire Wound)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R3	1.5Meg		6R3966	BTS-1.5Meg	
R4	1Meg		6R6046	BTS-1Meg	
R5	47K		6R6048	BTS-47K	
R6	470K		6R6032	BTS-470K	
R7	47K		6R6048	BTS-47K	
R8	470Ω		6R6090	BTS-470	
R9	12Meg		6R400334	BTS-12Meg	
R10	1Meg		6R6046	BTS-1Meg	
R11	5.6Meg		6R3988	BTS-5.6Meg	
R12	3.9Meg		6R490110	BTS-3.9Meg	
R13	36Meg		6K541294		
R14	330K		6R6014	BTS-330K	
R15	3.3Meg		6R2118	BTS-3.3Meg	
R16	120K		6R5631	BTS-120K	
R17	220K		6R6407	BTS-220K	
R18	10K		6R6320	BTS-10K	
R19	56Ω		6R5614	BTS-56	
R20	2.2Meg		6R6433	BTS-2.2Meg	
R21	18Ω		6R2031	BTS-18	
R22	5.6Ω 5%		17K739323		
R23			6K540634		Note 1
R24	82Ω		6R2035	BTS-82	

Note 1. Special Temperature Type, 10Ω @ 25°C.

TRANSFORMER (DRIVER)

ITEM No.	TURN RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	6:	1	25B540658	GH10 ①					① Tape Center Tap On Primary. Drill New Mtg. Hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	87.5Ω	3-4Ω	25K540741						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3-4Ω	50K541105	69A3	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	24B537770				Note 1
L2	RF Coil	24K536586				Note 1
L3	Osc. Coil	24K536595				Note 1
L4	Input IF	24K533461	16-6758	BC-352	12-C1	
L5	Output IF	24B533460	16-6770	BC-355	12-C6	
L6	"A" Lead Choke	24K580706				1.2 Microhenries

Note 1. Part of tuner M3, Part #77K537768, L1 (Part #24B537760), L2 (Part #24B502473), L3 (Part #24B502474) used in alternate tuners Part #77D537759 & 77D537758.

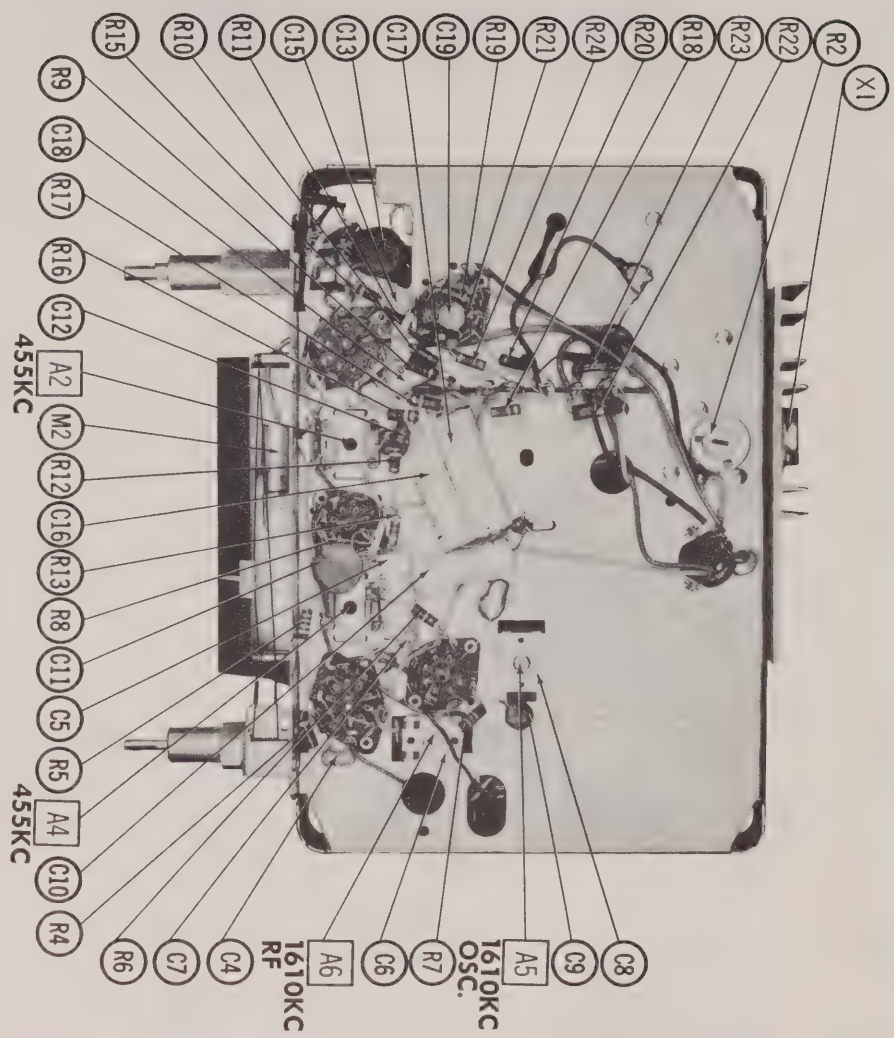
FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L7	.5A	.6Ω	8.8 Millihenry	25K540681					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	9A	65R16248		307009. (SFE9A)		SFE9	HRH

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Dial Light	65R533821	#1891
M3	Tuner	77K537768	Complete (MT-187)
	Tuner	77D537759	Complete (MT-186)
	Tuner	77D537758	Complete (MT-185)
M4	Spark Plate	64K535152	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

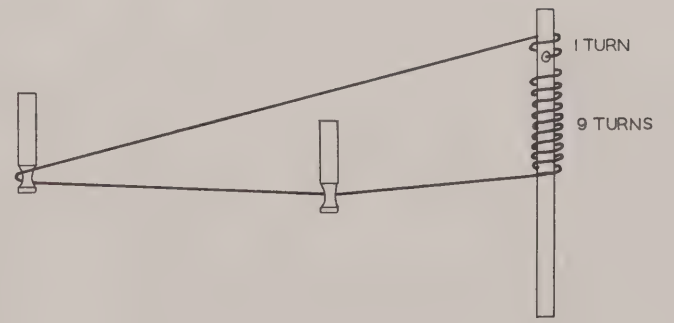
NAME	PART NO.	DESCRIPTION
Knob	36B541129	On-Off-Vol., Tuning
Knob	36B541139	Tone
	36K541140	Dummy
Cover	15K501306	Top (Wiring Side)
Cover	15D541317	Bottom (Tube Side)
Dial Scale	34B541632	
Pointer	52A541314	

EMITTER CURRENT ADJUSTMENT

Connect a milliammeter in series with the emitter terminal of the transistor (X1). The internal resistance of the meter should not exceed .5Ω. Connect a power source of 14 volts DC to the receiver and allow a warm-up period of 15 minutes. Adjust R2 for a meter reading of 500MA.

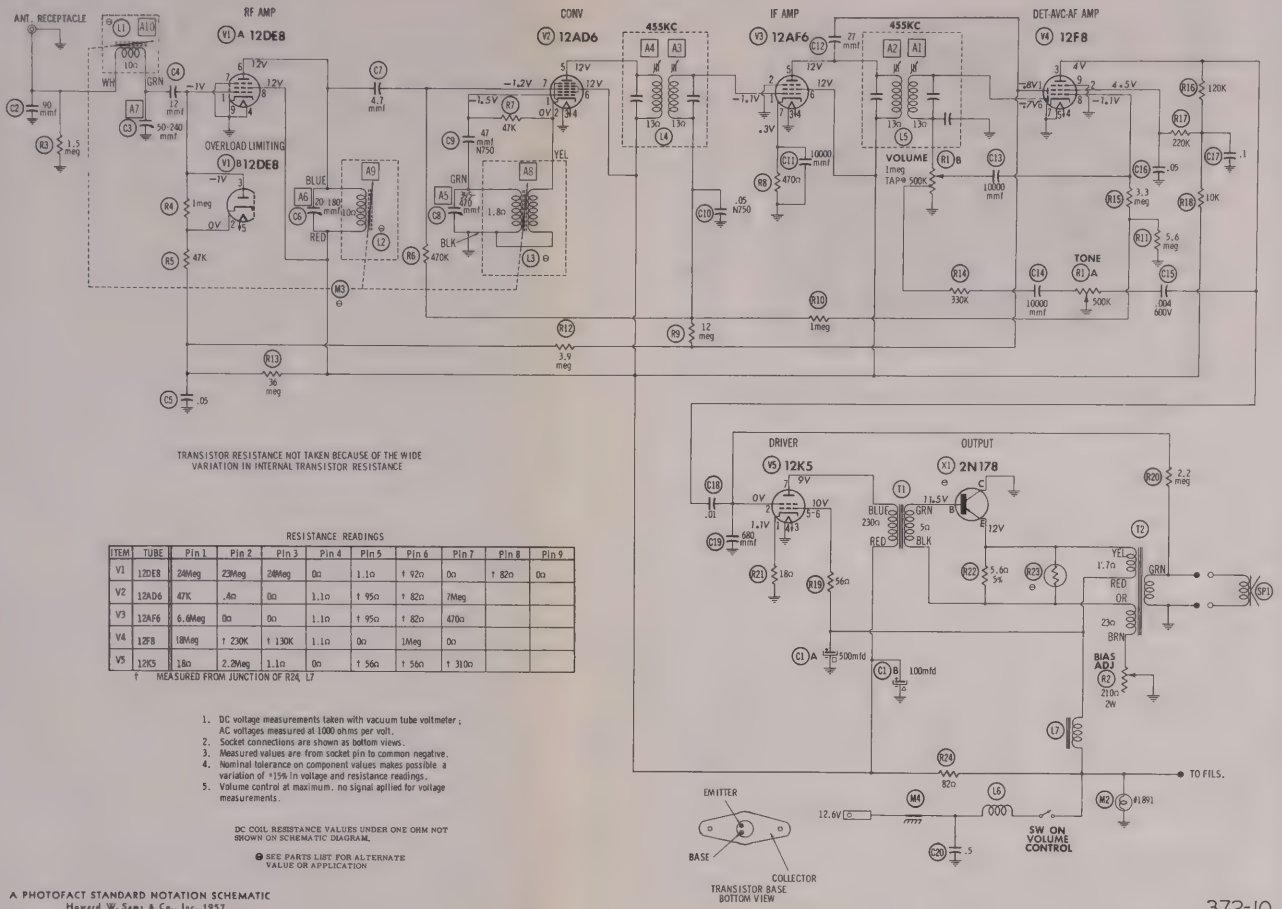
(Alternate Method)

Remove the transistor (X1) from its socket. Connect an ammeter (0-3 Amp.) in series with the receiver "A" lead. The internal resistance of the meter should not exceed .02Ω. Connect a power source of 14 volts DC to the receiver and allow a 15 minute warm-up period. Accurately measure the current, turn the receiver off and reconnect the transistor. Be certain that the mounting screws are tightened securely. Turn on the receiver and adjust R2 for an increase of 500MA in current drain.



TUNING GANG FULLY OPEN

DIAL CORD STRINGING



TRANSISTOR RESISTANCE NOT TAKEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DE8	24Meg	Z3Meg	24Meg	0Ω	1.1Ω	† 92Ω	0Ω	† 82Ω	0Ω
V2	12AD6	47K	.4Ω	0Ω	1.1Ω	† 95Ω	† 82Ω	7Meg		
V3	12AF6	6.6Meg	0Ω	0Ω	1.1Ω	† 95Ω	† 82Ω	470Ω		
V4	12F8	18Meg	† 230K	† 130K	1.1Ω	0Ω	1Meg	0Ω		
V5	12K5	18Ω	2.2Meg	1.1Ω	0Ω	† 56Ω	† 56Ω	† 310Ω		

† MEASURED FROM JUNCTION OF R24, L7

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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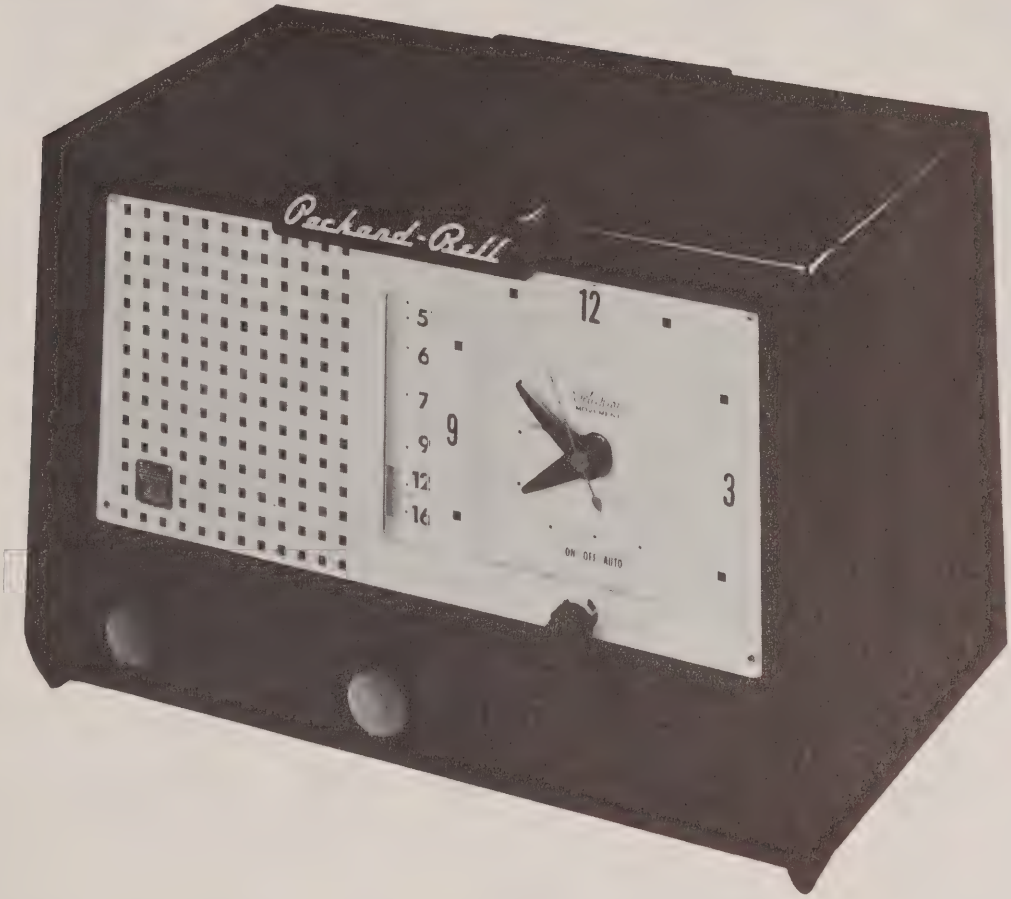

PACKARD-BELL
MODELS 5RC1, 5RC3, 5RC4

PACKARD-BELL
MODELS 5RC1, 5RC3, 5RC4

TRADE NAME	Packard-Bell Models 5RC1, 5RC3, 5RC4
MANUFACTURER	Packard-Bell Co., Service Div. 11th. & Hope Sts., Los Angeles 15, California
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .27 Amp. @ 117 Volts AC (28 Watts)
TUNING RANGE—BROADCAST	540 - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	540KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2		Loop	1620KC	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1500KC	Tune to 1500KC signal	"	A6	"

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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H145

DATE 9-57 SET 372 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	24090	PRS150V2040	BBRD4215	TCD485	TDLD-5	MTD-302	TVA-2438
B	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200	23705	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C3	22		23911	BPD-000022	DD-220	L10Q22	ED-22	UC-5422	5GA-Q22	
C4	220		23915	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C5	470		23916	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C6	5000		23931	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C7	10000		23929	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	10000		23939	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	.047	200	23705	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C10	.1	200	23707	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	25038	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Packard-Bell PART No.	IRC PART No.	
R2	47K		73145	BTS-47K	Note 1
R3	150Ω		73015	BTS-150	
R4	2.2Meg		73165	BTS-2.2Meg	
R5	4.7Meg		73169	BTS-4.7Meg	
R6	220K		73153	BTS-220K	

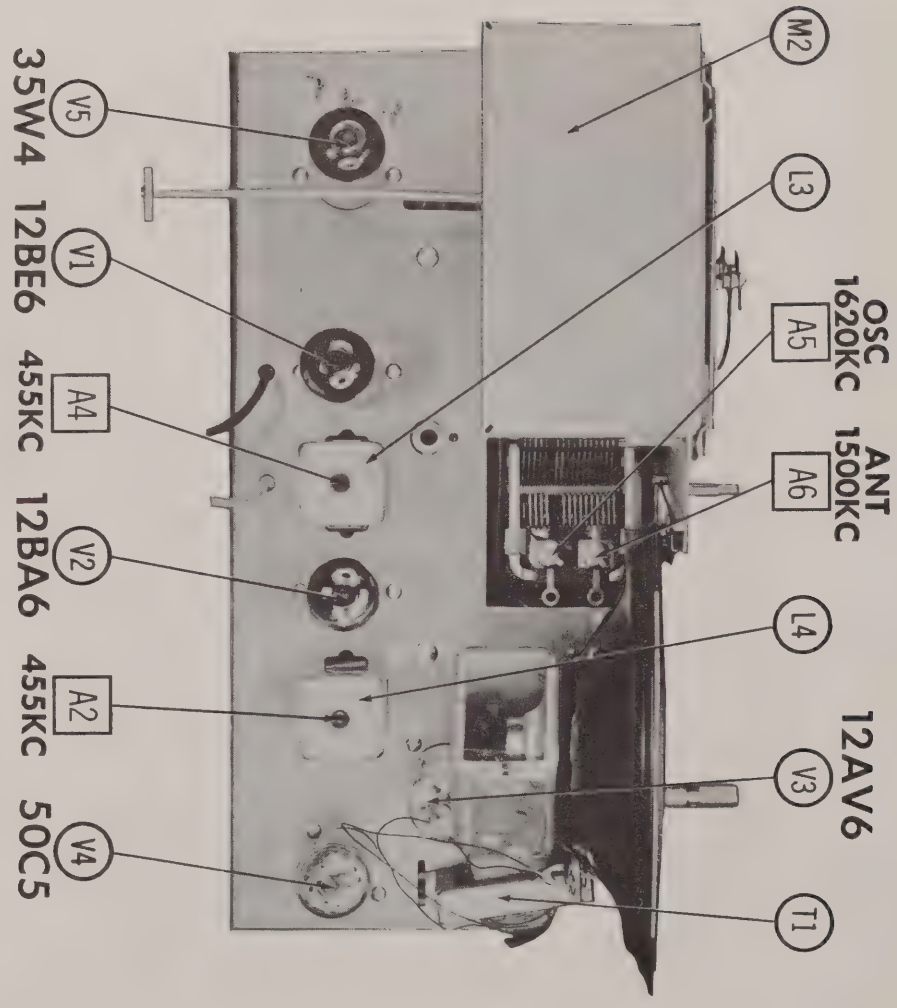
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Packard-Bell PART No.	IRC PART No.	
R7	470K		73157	BTS-470K	
R8	150Ω		73015	BTS-150	
R9	1000Ω	1	73325	BTA-1000	
R10	68Ω		73111	BTS-68	

Note 1. Model 5RC1 uses 220Ω (Part #73017)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	3-4Ω	89417A	Z1101	A-3025	A-3332	26S58	S-12X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Packard-Bell PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	83014	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	29351D				
L2	Osc. Coil	29230A	14-1074		70-OSC *	* Disregard Tap
L3	Input IF	29077	16-6758	BC-352	12-C1	Model 5RC3
	Input IF	29066	16-6758	BC-352	12-C1	Models 5RC1, 5RC4
L4	Output IF	29078	16-6758	BC-353	12-C2	Model 5RC3
	Output IF	29067	16-6758	BC-353	12-C2	Models 5RC1, 5RC4

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M1	Tuning Cap.	23539C	2 Gang (Ant. 28-285MMF, Osc. 10-90MMF)
M2	Clock	58061B	Model 5RC3
	Clock	58054G	Model 5RC1
	Clock	58062B	Model 5RC4
	Dial Light	54007	#43 (Model 5RC4 only)
	Switch	86055	Dial Light (Model 5RC4 only)

CABINETS & CABINET PARTS

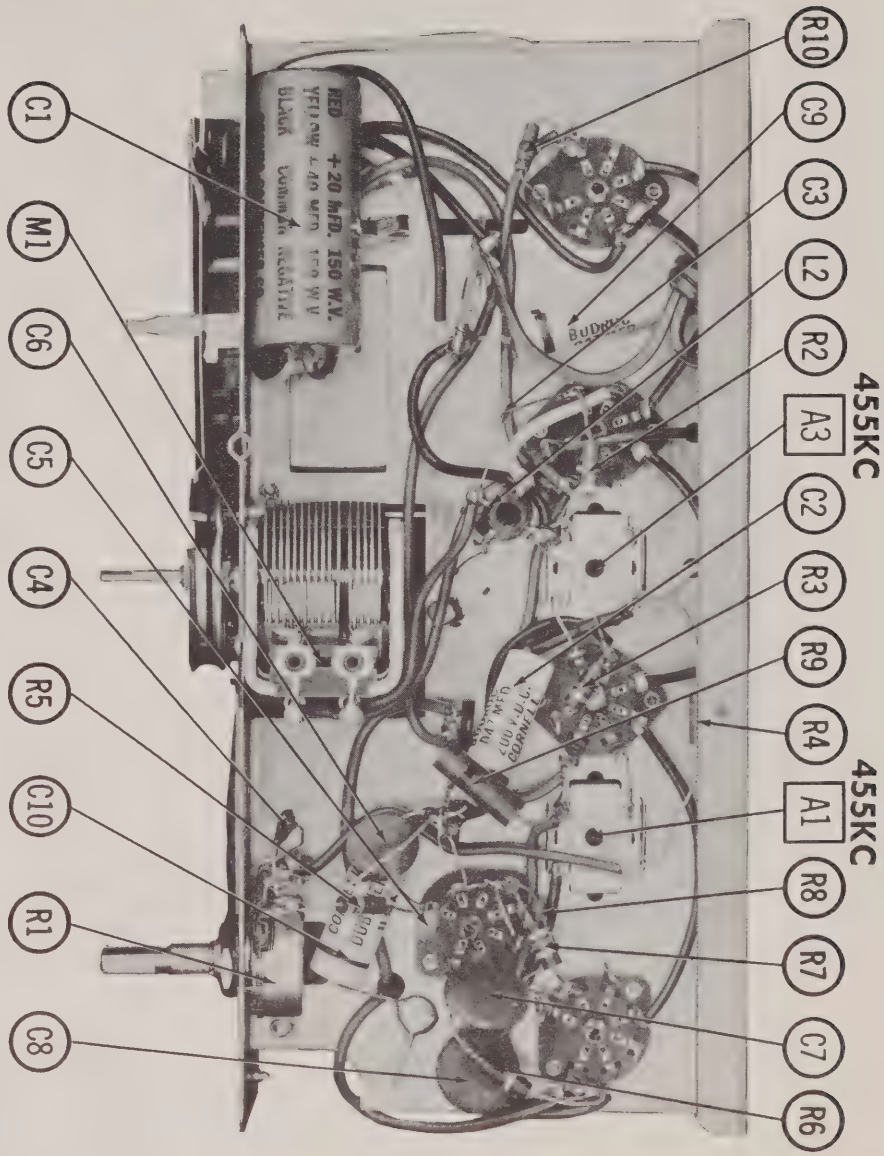
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52131	Tuning (Specify Color)
Knob	52132	Volume (Specify Color)
Knob	52133	Clock Control - Model 5RC1, 5RC4 (Specify Color)
Knob	52165	Clock Control - Model 5RC3 (Specify Color)
Cabinet		Order by Model Number and Color
Handle	49017	Model 5RC4 only
Dial	38149G	Model 5RC1, 5RC4
Dial	38159AK	Model 5RC3
Pointer	67040	

TUNING GANG FULLY CLOSED

DIAL CORD STRINGING

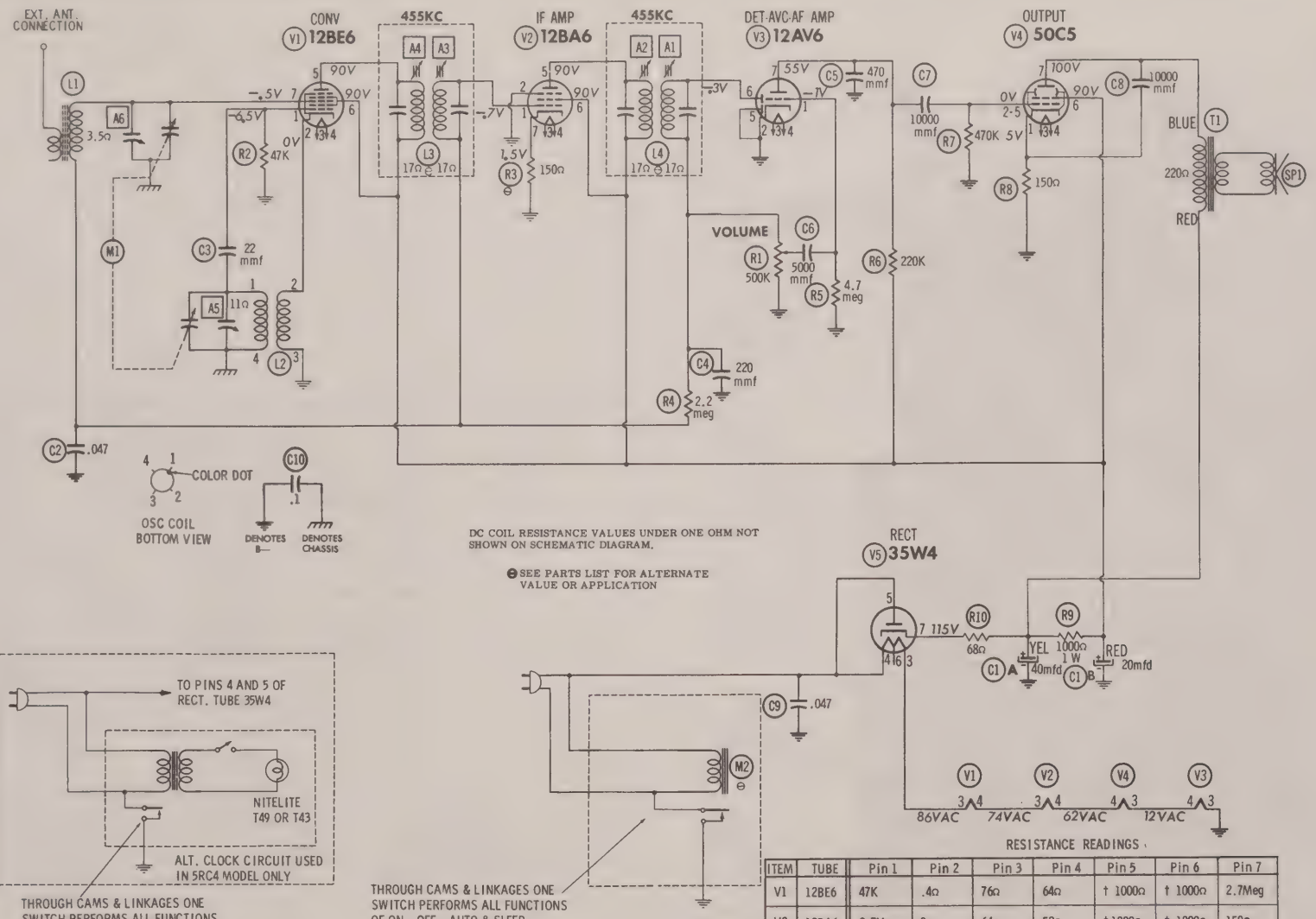
CHASSIS—BOTTOM VIEW



SET 372 FOLDER 11

PACKARD-BELL MODEL 5RC1

PACKARD-BELL MODEL 5RC1



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

TO PINS 4 AND 5 OF RECT. TUBE 35W4
NITELITE T49 OR T43
ALT. CLOCK CIRCUIT USED IN 5RC4 MODEL ONLY
THROUGH CAMS & LINKAGES ONE SWITCH PERFORMS ALL FUNCTIONS OF ON - OFF - AUTO & SLEEP.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	47K	.4Ω	76Ω	64Ω	† 1000Ω	† 1000Ω	2.7Meg
V2	12BA6	2.7Meg	0Ω	64Ω	52Ω	†1000Ω	† 1000Ω	150Ω
V3	12AV6	4.7Meg	0Ω	0Ω	12Ω	0Ω	500K	† 220K
V4	50C5	150Ω	470K	12Ω	52Ω	470K	† 1000Ω	† 290Ω
V5	35W4	TP	NC	76Ω	100Ω	100Ω	NC	20K(Min)

† MEASURED FROM PIN 7 OF V5
TP TIE POINT
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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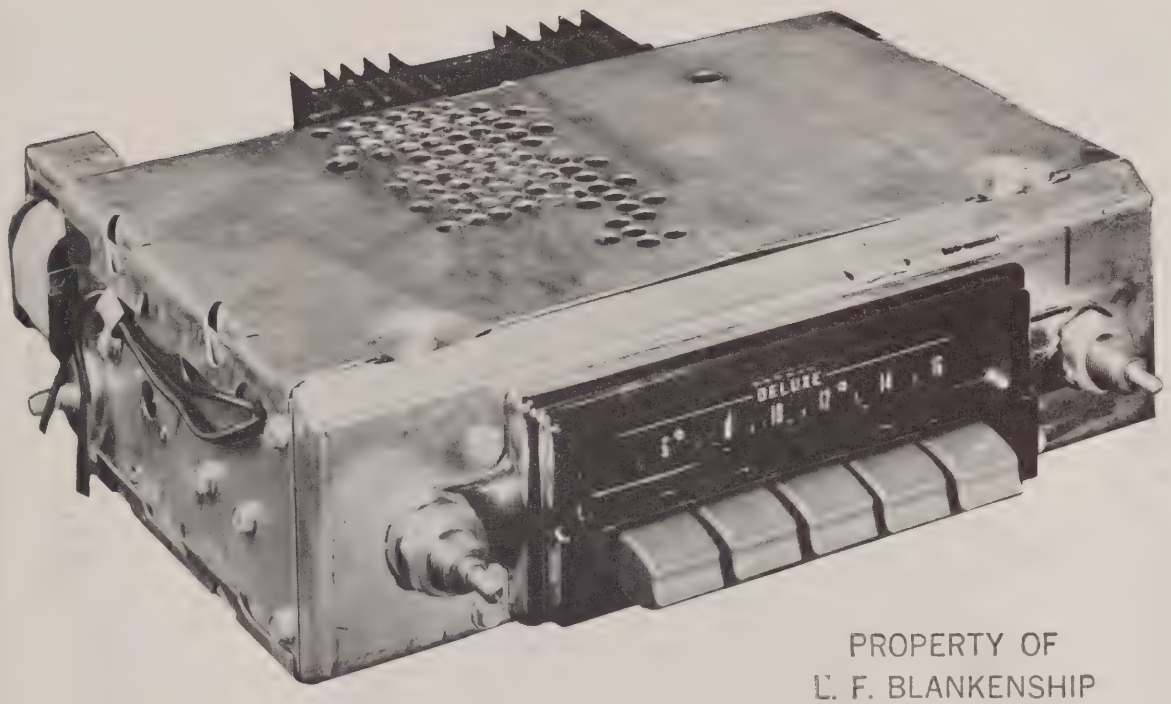
372-11

PONTIAC
MODEL 988671



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DENVER, COLORADO

PONTIAC
MODEL 988671

TRADE NAME	Pontiac Model 988671 (For 1957 Pontiac Automobiles)
MANUFACTURER	Delco Radio Div., G.M. Corp., Kokomo, Indiana
TYPE SET	Battery Operated Custom Built AM Automobile Receiver With Transistorized Output
TUBES (Five)	Types 12AF6 RF Amplifier, 12AD6 Converter, 12AF6 IF Amplifier, 12F8 Det.-AVC-AF Amp., 12K5 Driver
POWER SUPPLY	12 Volt Storage Battery — RATING 2 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

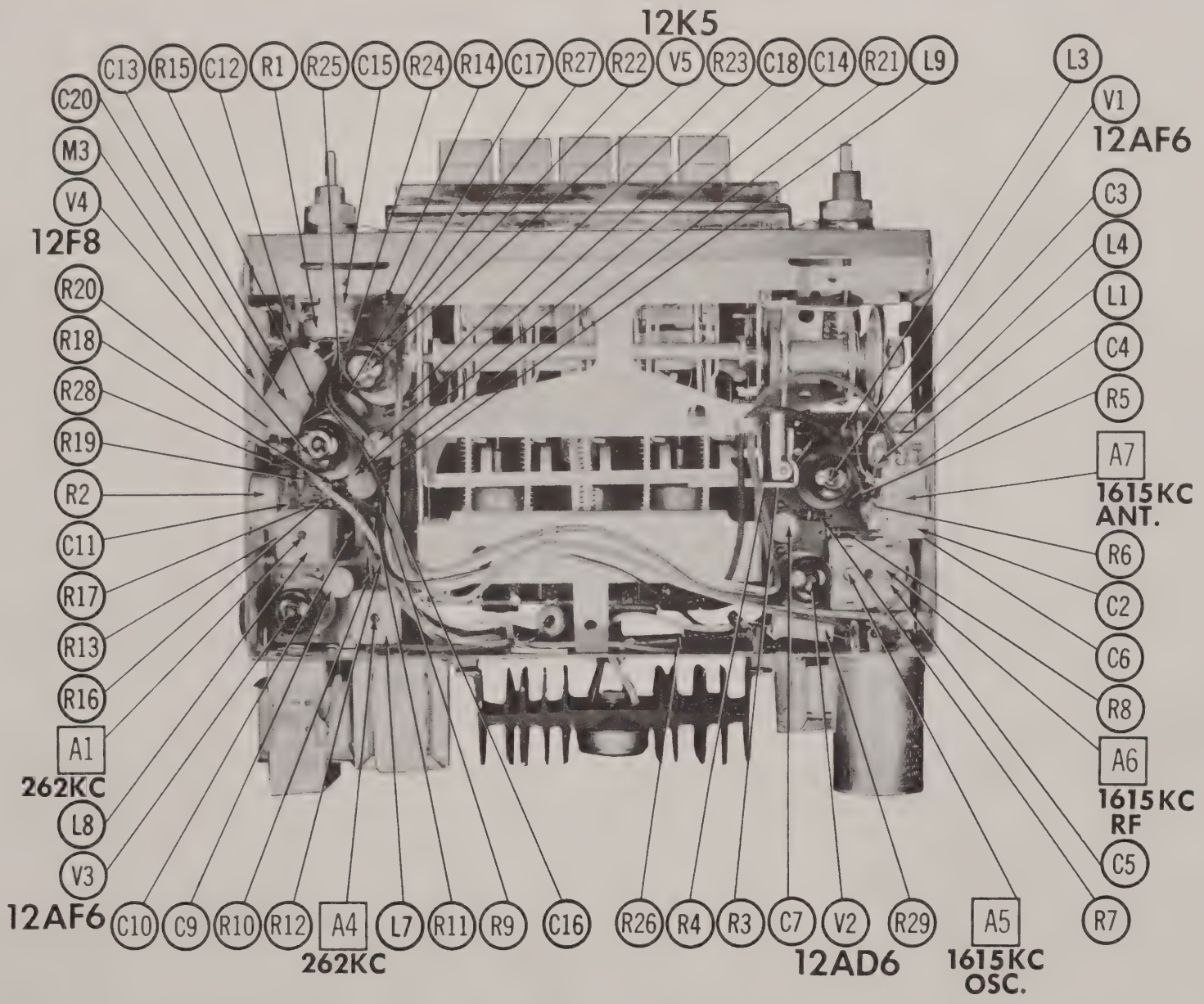
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Tone control to "Treble".

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400% Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
	Check setting of oscillator core (A8). Rear of core should be 1 5/8" from mounting end of coil form.						
2	47MMF	High side to Antenna Receptacle. Low side to chassis.	1615KC	High frequency end stop	Across voice coil	A5, A6, A7	Adjust for maximum output.
3	"	"	600KC	Tune to 600KC signal	"	A9, A10	"
4	"	"	1615KC	High frequency end stop	"	A6, A7	"
5	"	"	1000KC	Tune to 1000KC signal	"		If necessary, adjust pointer adjustment screw so that pointer coincides with 1000KC on dial.
6	With radio installed in car and antenna fully extended, tune in a weak station between 600KC and 1000KC, and adjust A7 for maximum volume.						

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton to the left and out.
2. Tune manually to desired station.
3. Press pushbutton in firmly.
4. Repeat on remaining pushbuttons.

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12AF6	
V2	Converter	12AD6	
V3	IF Amplifier	12AF6	

ITEM No.	USE	TYPE	NOTES
V4	Det. -AVC-AF Amp.	12F8	
V5	Driver	12K5	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N278	Output				

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	16	7269719						R2424 *
B	■500	16							
C	▲1000	16							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2A			7269635							
B										
C3	.047	200	6612	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	
C4	68		6369	BPD-000068	DD-680	L10Q68	ED-68	UC-5468	5GA-Q68	
C5A										
B										
C			7268828							
D										
C6	39		6366	BPD-000039	DD-390	L10Q39	ED-39	UC-5439	5GA-Q39	
C7	.047	50	6612	P288N-05		BC2S47J		ACE6147	2SE-S47	
C8	180		7257424							N150
C9	.047	50	6612	P288N-05	DF-503	BC2S47J		ACE6147	2SE-S47	
C10	47		6367	1468-000047	D6-470	5W5Q47	ED-47	UC-5447	1FM-447	
C11	47		6367	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C12	220	500	6375	1468-00022	D6-221	5W5T22	ED-220	UC-5322	1FM-322	
C13	.022	200	6611	BPD-02	DD-203	CUB6S22	ED-02	GEM-2122	2TM-S22	
C14	.1	50	7269714	P288N-1		BC2P1J		ACE601	2SE-P10	
C15	.0068	200	7269715	BPD-0068	D6-682	CUB6D68	ED-0068	GEM-6268	6TM-D68	
C16	220	500	6375	1468-00022	D6-221	5W5T22	ED-220	UC-5322	1FM-322	
C17	4700		6631	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C18	.047	50	6612	P288N-05	DF-503	BC2S47J		ACE6147	2SE-S47	
C19	.05	200	6612	BPD-05	DF-503	CUB2S5		GEM-4147	2TM-S5	
C20	.47	100	6692	P288N-47		CUB2P47		GEM-2047	2TM-P47	
C21	220			BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	①

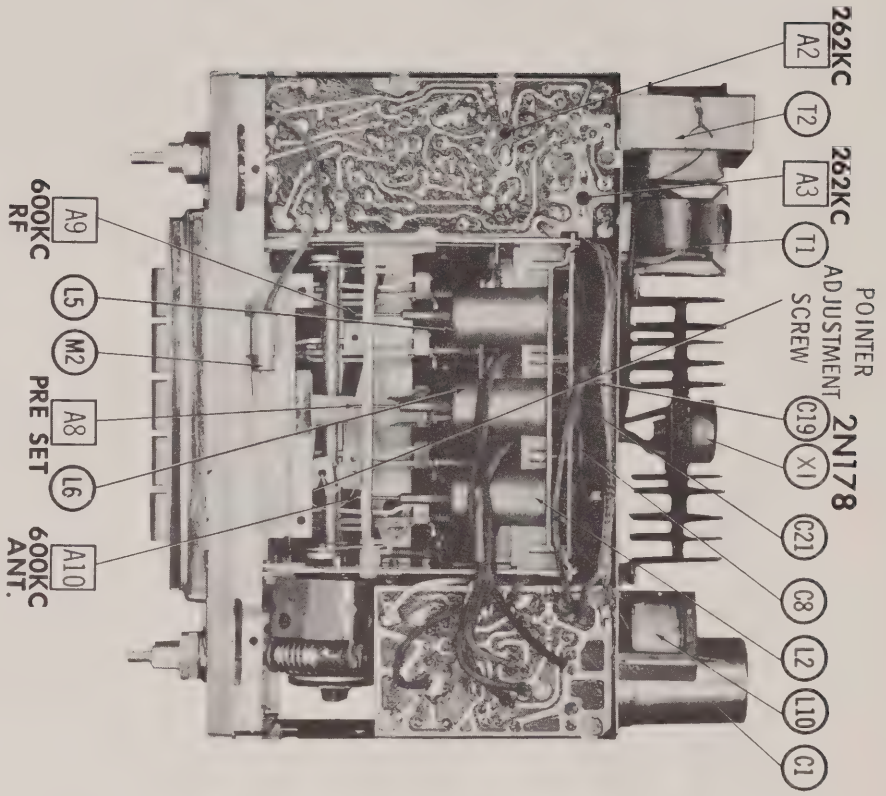
① Not used in some versions

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	7270189 ①				UE1777S	Tone
B	1Meg							Volume, Tap② 200K
C	Switch							
R2	100Ω	2	7269637		39-100		FL-150	Transistor Bias Adjust (Wire Wound)

① Alternate Part #7269638

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DELCO PART No.	IRC PART No.	
R3	1Meg		1235	BTS-1Meg	
R4	1. 5Meg		1237	BTS-1. 5Meg	
R5	10K		1137	BTS-10K	
R6	15Meg		1249	BTS-15Meg	
R7	680K		1233	BTS-680K	
R8	33K		1217	BTS-33K	
R9	1Meg		1235	BTS-1Meg	
R10	2. 2Meg		1239	BTS-2. 2Meg	
R11	1Meg		1235	BTS-1Meg	
R12	560K		1232	BTS-560K	
R13	47K		1219	BTS-47K	
R14	68K		1221	BTS-68K	
R15	6. 8Meg		1245	BTS-6. 8Meg	
R16	120K		1224	BTS-120K	
R17	2700Ω		1130	BTS-2700	
R18	18K		1214	BTS-18K	
R19	270K		1228	BTS-270K	
R20	1800Ω		1128	BTS-1800	
R21	470K		1231	BTS-470K	
R22	39Ω		1108	BTS-39	
R23	15Ω		1103	BTS-15	
R24	390Ω		1120	BTS-390	
R25	82Ω		1112	BTS-82	
R26	150Ω	1		BTA-150	Note 1
R27	10Ω		1101	BTS-10Ω	
R28	120Ω	2	1188	BTB-120	
R29	. 47Ω	1	7269709		

Note 1. Some versions may use $\frac{1}{2}$W unit (Part #1115).

TRANSFORMER (AUDIO INPUT)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	50:	1	7269877						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9Ω	3-4Ω	7269650						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	6" X 9"	PM	3-4Ω	7268329	69A3	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		DELCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Antenna Coupling Coil	7255738	19-1004	BC-565	4612	7 Microhenries
L2	Antenna Coil	7258914				
L3	RF Choke	7240251	19-6022		4626	28 Microhenries
L4	RF Choke	7269684				
L5	RF Coil	7258914				
L6	Osc. Coil	1221031				
L7	Input IF	1221015				
L8	Output IF	1221021				
L9	Fil. Choke	1217846				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L10	1A	. 26Ω	3 Millihenries	7269647					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			DELCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A	455640		30307. 5 (7AG 7½A)		SFE 7½A	

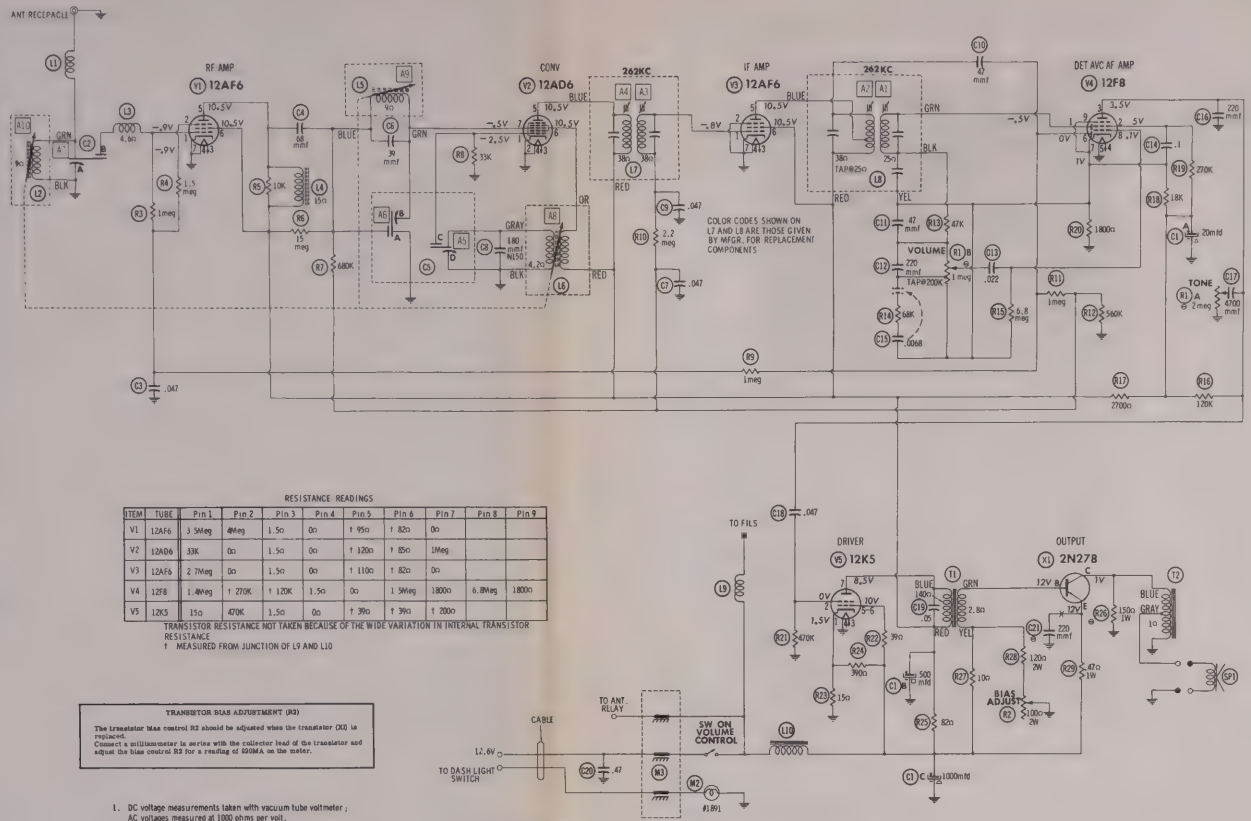
MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M2	Dial Light	456985	#1891
M3	Spark Plate	1220582	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	523150	Control (2 Used)
Knob	523507	Control (2 Used)
Knob	518914	Dummy
Knob	518915	Tone
Dial	7269540	



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AF6	3.5Meg	4Meg	1.5Ω	0Ω	↑ 95Ω	↑ 82Ω	0Ω		
V2	12AD6	33K	0Ω	1.5Ω	0Ω	↑ 120Ω	↑ 85Ω	1Meg		
V3	12AF6	2.7Meg	0Ω	1.5Ω	0Ω	↑ 110Ω	↑ 82Ω	0Ω		
V4	12F8	1.4Meg	↑ 270K	↑ 120K	1.5Ω	0Ω	1.5Meg	1800Ω	6.8Meg	1800Ω
V5	12K5	15Ω	470K	1.5Ω	0Ω	↑ 39Ω	↑ 39Ω	↑ 200Ω		

TRANSISTOR RESISTANCE NOT TAKEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE
↑ MEASURED FROM JUNCTION OF L9 AND L10

TRANSISTOR BIAS ADJUSTMENT (R2)

The transistor bias control R2 should be adjusted when the transistor (X1) is replaced.
Connect a milliammeter in series with the collector lead of the transistor and adjust the bias control R2 for a reading of 20MA on the meter.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

SONORA
MODELS 537, 538

MODEL 538

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SONORA
MODELS 537, 538

TRADE NAME	Sonora Models 537, 538
MANUFACTURER	Sonora Radio & Tel. Corp., 325 N. Hoyne Ave., Chicago, Illinois
TYPE SET	Three Power Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY	110-120 Volts AC-DC (Or) 3 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	.15 Amp. @ 117 Volts AC (Or) 150MA @ 3 Volts DC & 7.5MA @ 67.5 Volts DC (9 Watts)
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det.-AVC-AF Amplifier	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	R-1728	PRS150V/25V	BBRT5315C10	FP309	TDLT-16	FMT-331	TVA-3430
B	30	150		50-30/100					
C	100	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	50		N-6375	SI50	D6-500	LT6Q5	GP-50	UC545	5GA-Q5	
C3	5000		N-6272	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C4	20000		R-1760	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C5	5000		N-6272	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C6	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	①
C7	.047	200	R-1462	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	
C8	.1	200	N-1351	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C9	20000		R-1760	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C10	20000		R-1760	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	

① Some versions may use a 2000MMF in the application (Part #R-1105).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	R-1724	B-70 ①	A47-1Meg-Z ①	Q13-137 ①	U53	Volume, 50K Stop
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-2	SWE-20	76-2	US-27	

① Use 50K resistor in series with right hand terminal viewed from shaft, terminals down.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R2	100K		N-1778	BTS-100K	
R3	10K		N-4895	BTS-10K	
R4	470Ω		N-4066	BTS-470	
R5	3.3Meg			BTS-3.3Meg	Note 1
R6	10Meg		N-1263	BTS-10Meg	
R7	27Ω		N-6792	BTS-27	
R8	2.2Meg		N-4277	BTS-2.2Meg	

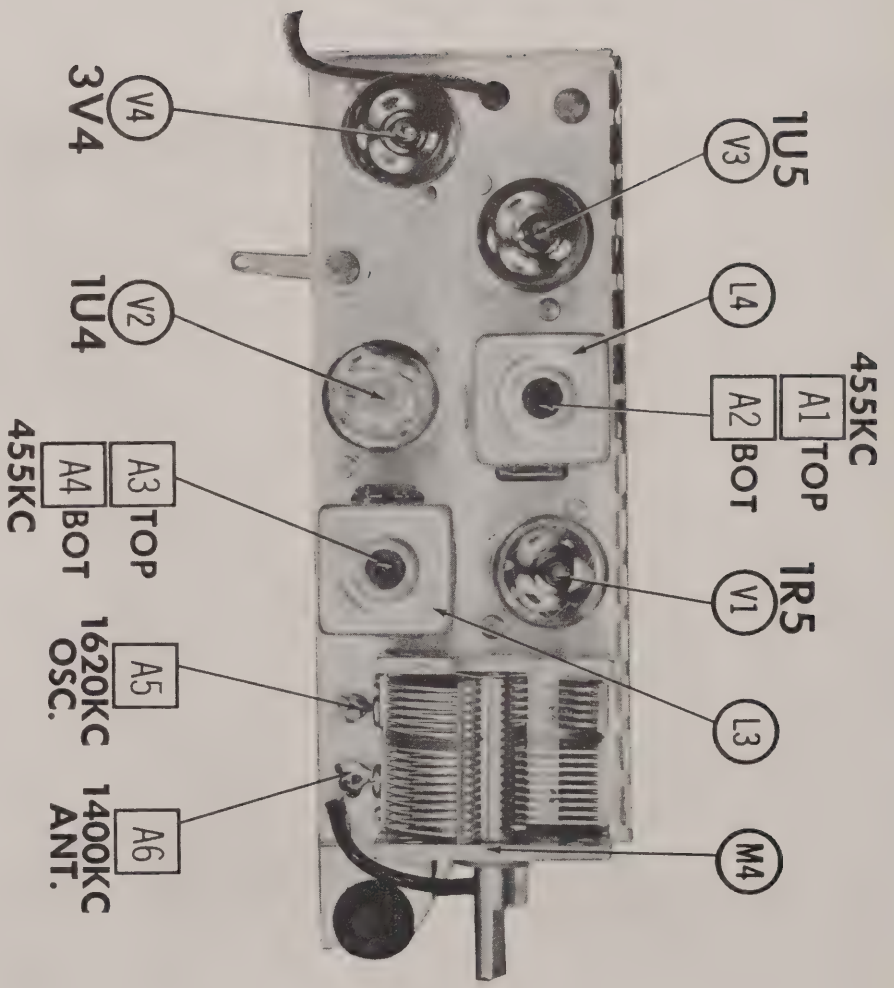
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R9	390Ω		N-5159	BTS-390	
R10	470Ω		N-4066	BTS-470	
R11	150Ω		N-3663	BTS-150	
R12	2230Ω 5%	7	R-1762		
R13	270Ω		N-4121	BTS-270	
R14	3300Ω		N-6718	BTS-3300	
R15	100Ω	3	R-1152		

Note 1. Not used in some versions

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	9200Ω	3-4Ω	R-1727				24S49		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONORA PART No.	QUAM PART No.	
SP1	3 1/2"	PM	3-4Ω	R-1751	3A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	R-1754				
L2	Osc. Coil	R-1753				
L3	Input IF	R-1752	16-6758	BC-352	12-C1	
L4	Output IF	R-1752	16-6758	BC-353	12-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SONORA PART No.	REPLACEMENT DATA
K1	Audio Coup. Net	5000MMF, 10000MMF, 2000MMF, 150MMF, 150MMF, 10Meg, 1. Meg 3. 3Meg, 4. 7Meg	R-1119	Aerovox PA-521 Centralab PC-165 Sprague DP-1

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SONORA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.057A	N-8331	1002A	RS065Q	6S65	65	

BATTERIES

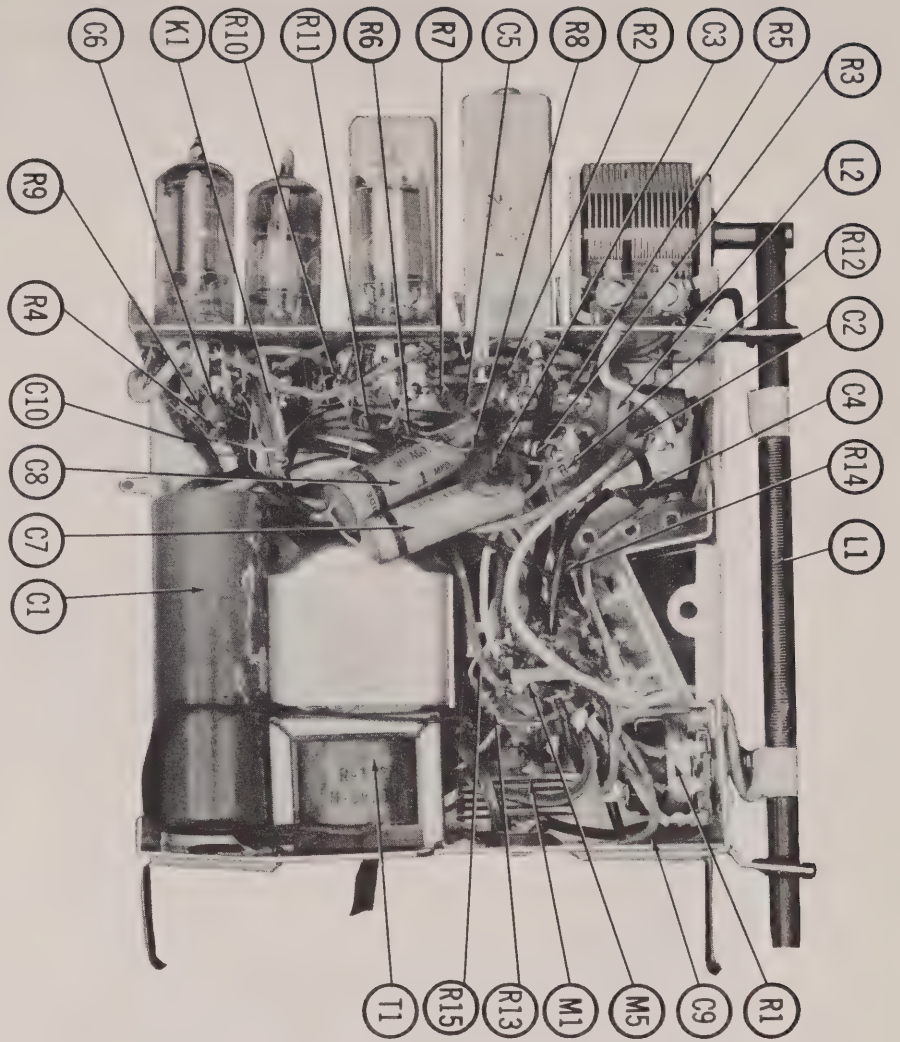
ITEM No.	VOLTAGE	SONORA PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M2	1. 5V		2R		950		M-13		2LP		①
M3	67. 5V			P45		477		M-211P		211P	

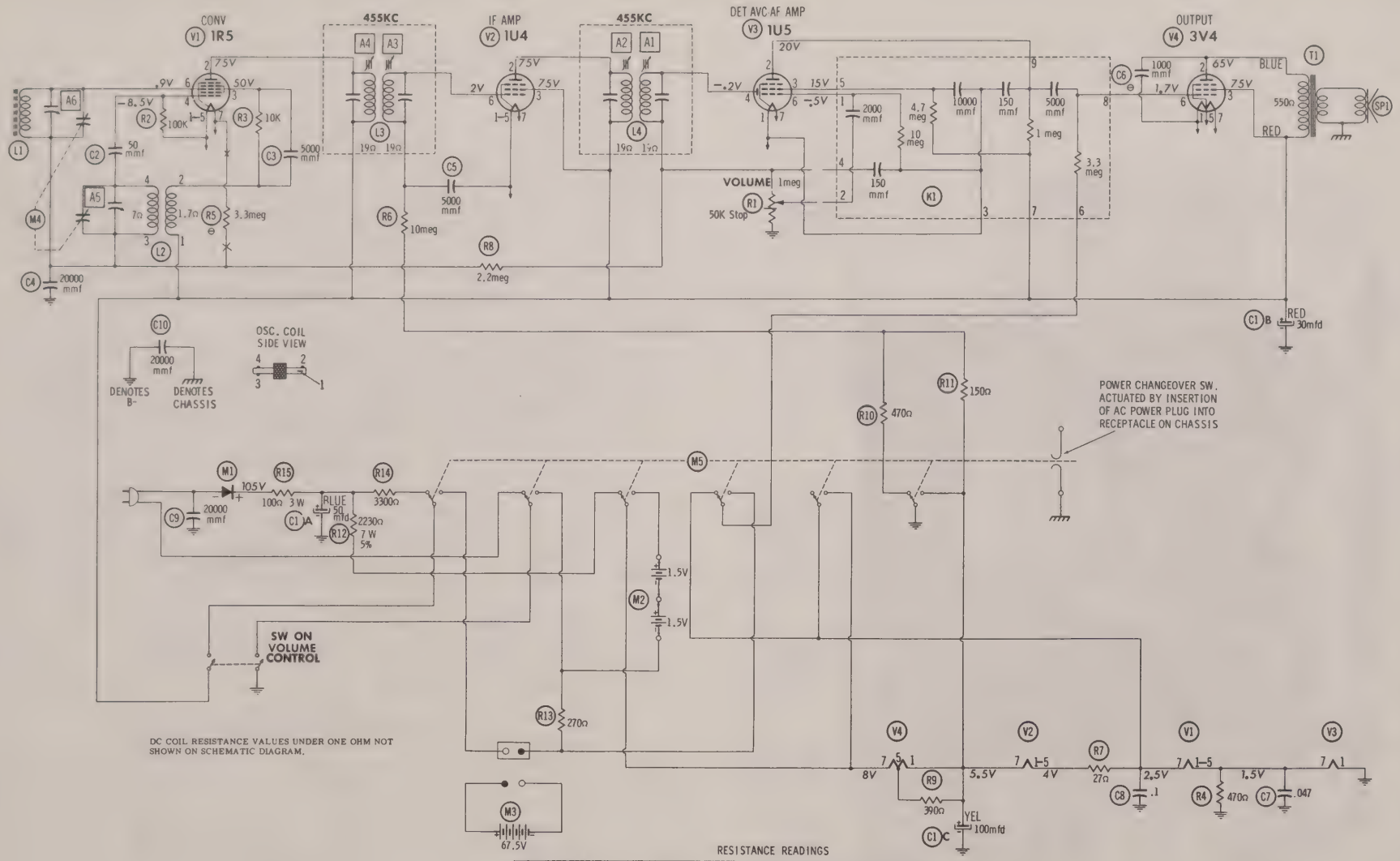
① Connect two in series.

MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M4	Tuning gang	R-1725	2 Gang (Ant. 13-235MMF, Osc. 13-114MMF)
M5	Switch	R-1660	Power Change-Over (Rotary Wafer Type)

CHASSIS—BOTTOM VIEW





DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	°	† 3400Ω	† 13K	100K	°	3.2Meg	°
V2	1U4	°	† 3400Ω	† 3400Ω	TP	°	10Meg	°
V3	1U5	°	† 1Meg	† 4.7Meg	1Meg	°	10Meg	°
V4	3V4	°	† 4000Ω	† 3400Ω	TP	°	3.3Meg	°

° DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.
TP TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

TRAV-LER MODELS 621-300, U, 621-302, U (Ch. 631-36, 631-56, 632-36, 632-56)

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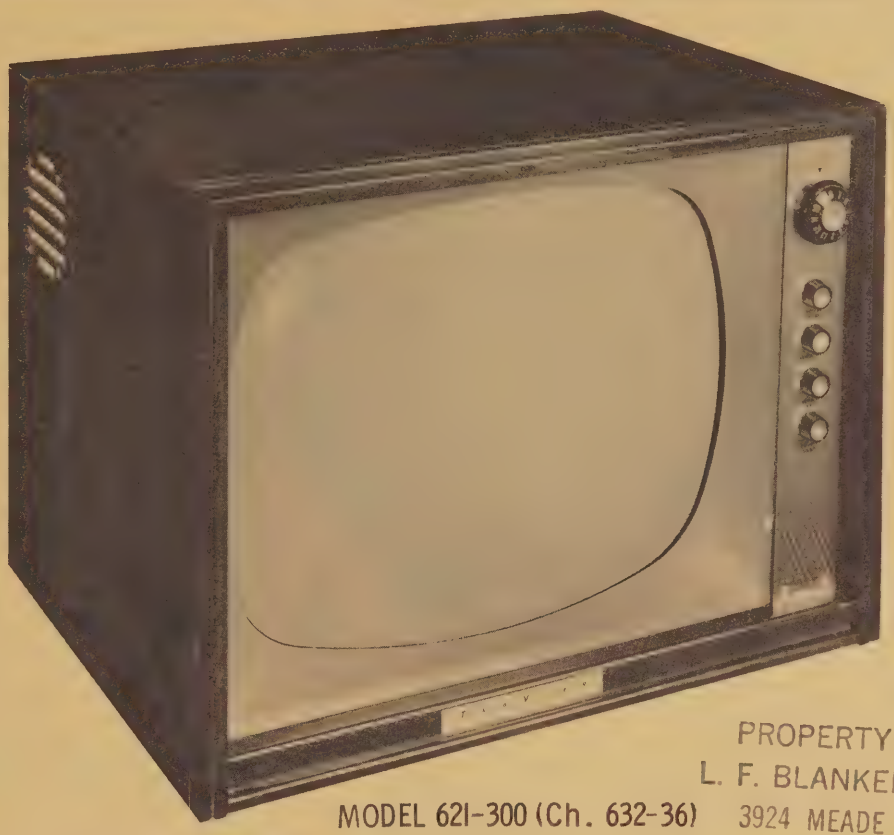

MODEL 621-300 (Ch. 632-36)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

TRAV-LER MODELS 621-300, U, 621-302, U
(Ch. 631-36, 631-56, 632-36, 632-56)

TRADE NAME	TRAV-LER	MODELS	CHASSIS
		621-300, 621-302	632-36
		621-300, 621-302	632-56
		621-300U, 621-302U	631-36
		621-300U, 621-302U	631-56
MANUFACTURER	Trav-Ler Radio & Tele. Corp., 571 West Jackson Blvd., Chicago 6, Illionois		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 115 Watts, 1 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13VHF, 14 thru 83UHF, Video IF 45. 75MC, Sound IF 41. 25MC (Intercarrier)		

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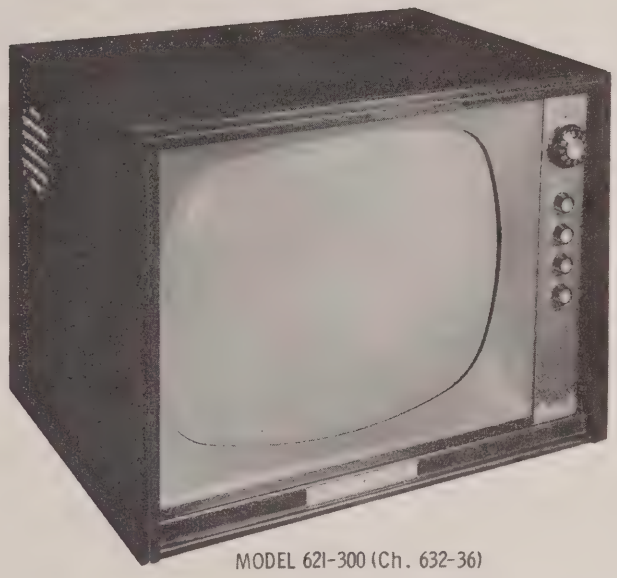
DATE 9 – 57 SET 372 FOLDER 14

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push on type control knobs from the front.
2. Remove 8 wood screws and the rear cover.
3. Remove the picture tube socket, yoke plug, HV lead and 2 speaker leads.
4. Remove 2 metal screws holding the chassis to the top and bottom side rails.
5. Remove the chassis.
6. Remove 4 speaker nuts and the speaker.



MODEL 621-300 (Ch. 632-36)

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

MODELS	CHASSIS
621-300, 621-302	632-36
621-300, 621-302	632-56
621-300U, 621-302U	631-36
621-300U, 621-302U	631-56

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube, and safety glass cleaning, it is necessary to remove the chassis. (See disassembly instructions.)

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10 or 6 and 2. Readjust the Ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location see tube placement chart).

FUSES

A 5.6Ω fusible resistor R73 is used for LV power supply protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

TRAV-LER MODELS 621-300, U, 621-302, U
(Ch. 631-36, 631-56, 632-36, 632-56)

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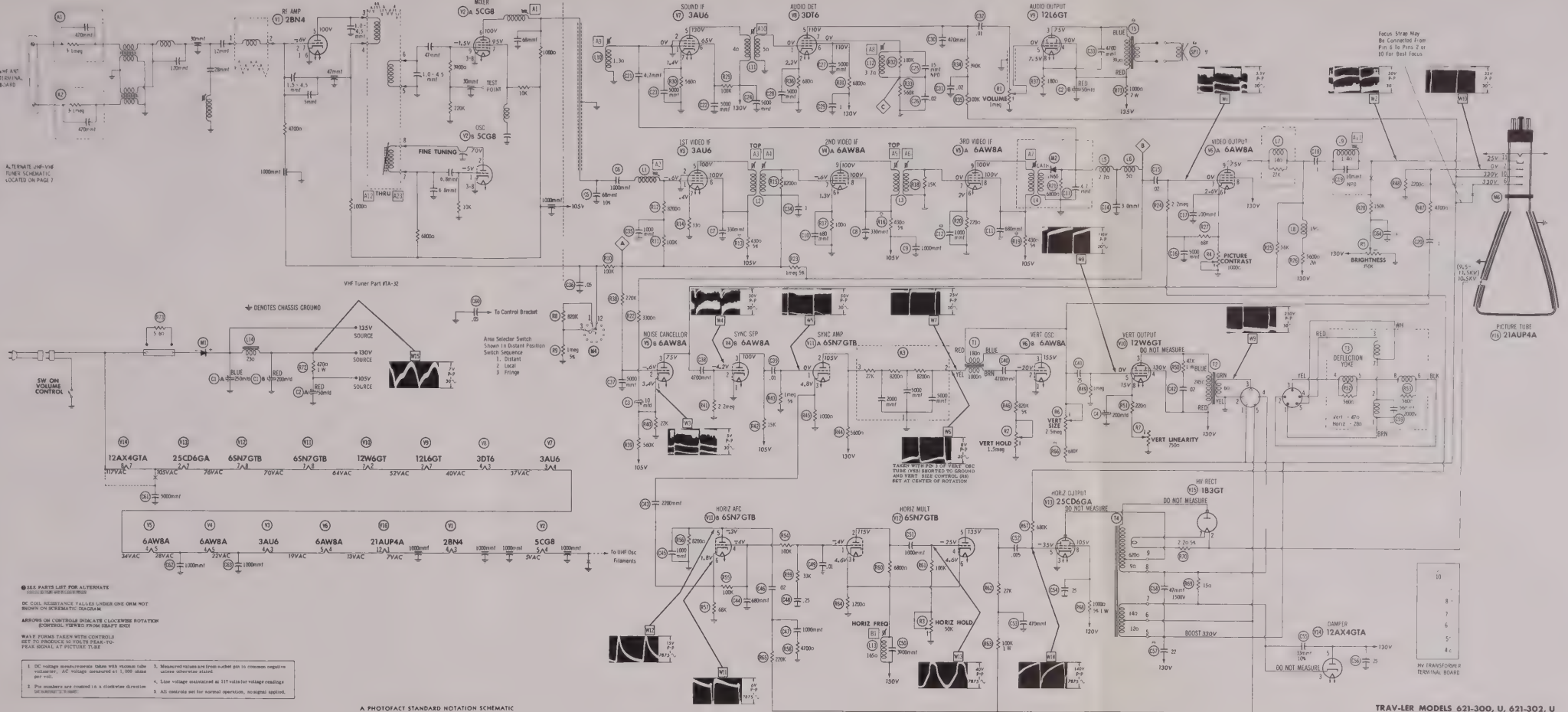

SEE PARTS LIST FOR ALTERNATE

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 90 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction (as viewed from the base).
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

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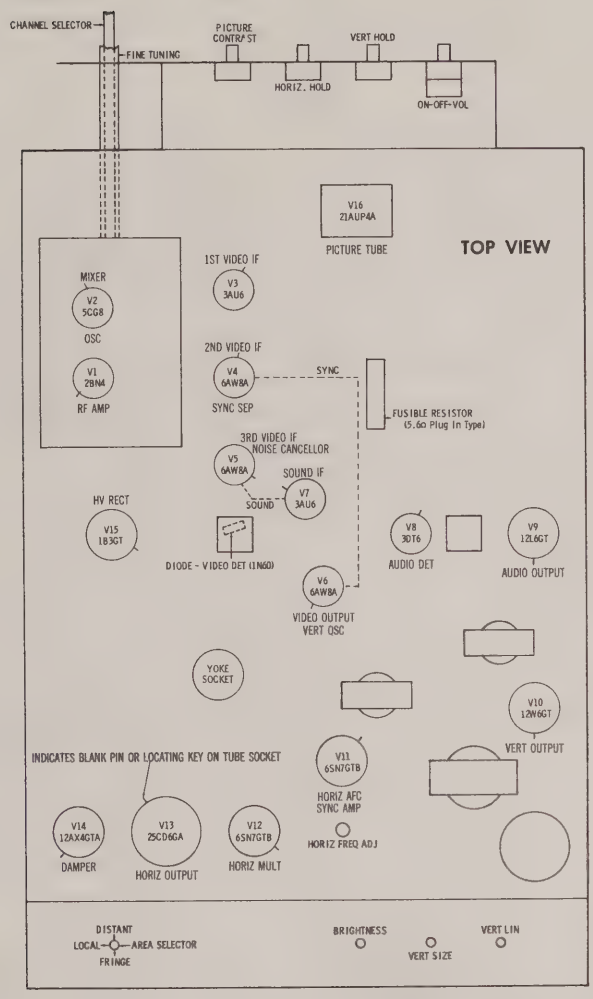
TRAV-LER MODELS 621-300, U, 621-302, U (Ch. 631-36, 631-56, 632-36, 632-56)

TUBE PLACEMENT CHART



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DENVER, COLORADO

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

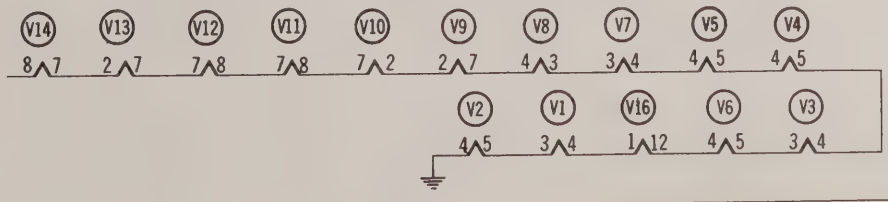
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R73), Rectifier (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M2)**
No pic, no sound, has snow - **V1, V2**
No pic, has sound, has raster - **V6, V16**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V5, V4, V11**
No horiz. sync - **V5, V4, V11**
No vert. or horiz. sync - **V5, V4, V11**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15, V16**
No vertical deflection - **V6, V10**
Poor vert. linearity or foldover - **V6, V10**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, M1**
Vert. off freq. - **V6**
Horiz. off freq. - **V12**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Do not remove the horizontal multivibrator tube (V12) to disable the high voltage circuit.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Turn contrast control fully counter clockwise.
Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-oscillator tube (V2). Low side to chassis.	44.0MC (10MC Swp)	41.25MC 45.75MC	12	Vert. Amp. thru 10K to point (B). Low side to chassis.	A1, A2, A3, A4, A5, A6, A7	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust A1 for low frequency side of curve, A2 for high side, A3 for high side, A4 for low side, A5 for high side, A6 for low side and A7 for center of curve.

SOUND IF ALIGNMENT

1. Tune in a strong TV signal and adjust controls for normal operation.
2. Adjust A8 for maximum undistorted audio output. If two peaks occur, use the one producing the higher voltage at point (C). This voltage is normally approximately -5 volts.
3. Reduce the air signal by disconnecting the antenna or detuning the fine tuning until distortion occurs in the audio. Adjust A9 and A10 for maximum undistorted audio output.
4. Reduce the signal further and retouch A9 and A10 for maximum undistorted audio output.
5. It may be advisable in some cases to repeat this procedure for optimum sound.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust A11 for MINIMUM 4.5MC beat interference in the picture.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (B). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 2. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

UHF TUNER AND VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

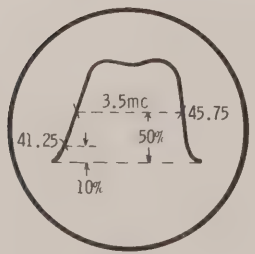


FIG. 1

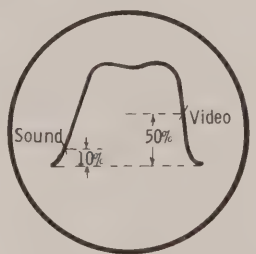


FIG. 2

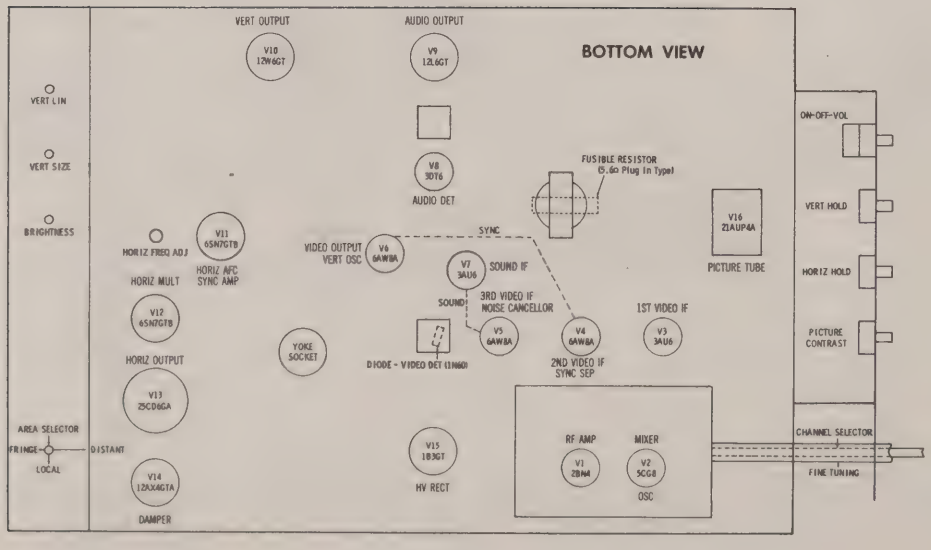
CHASSIS TOP VIEW

TRAV-LER MODELS 621-300, U, 621-302, U
(Ch. 631-36, 631-56, 632-36, 632-56)

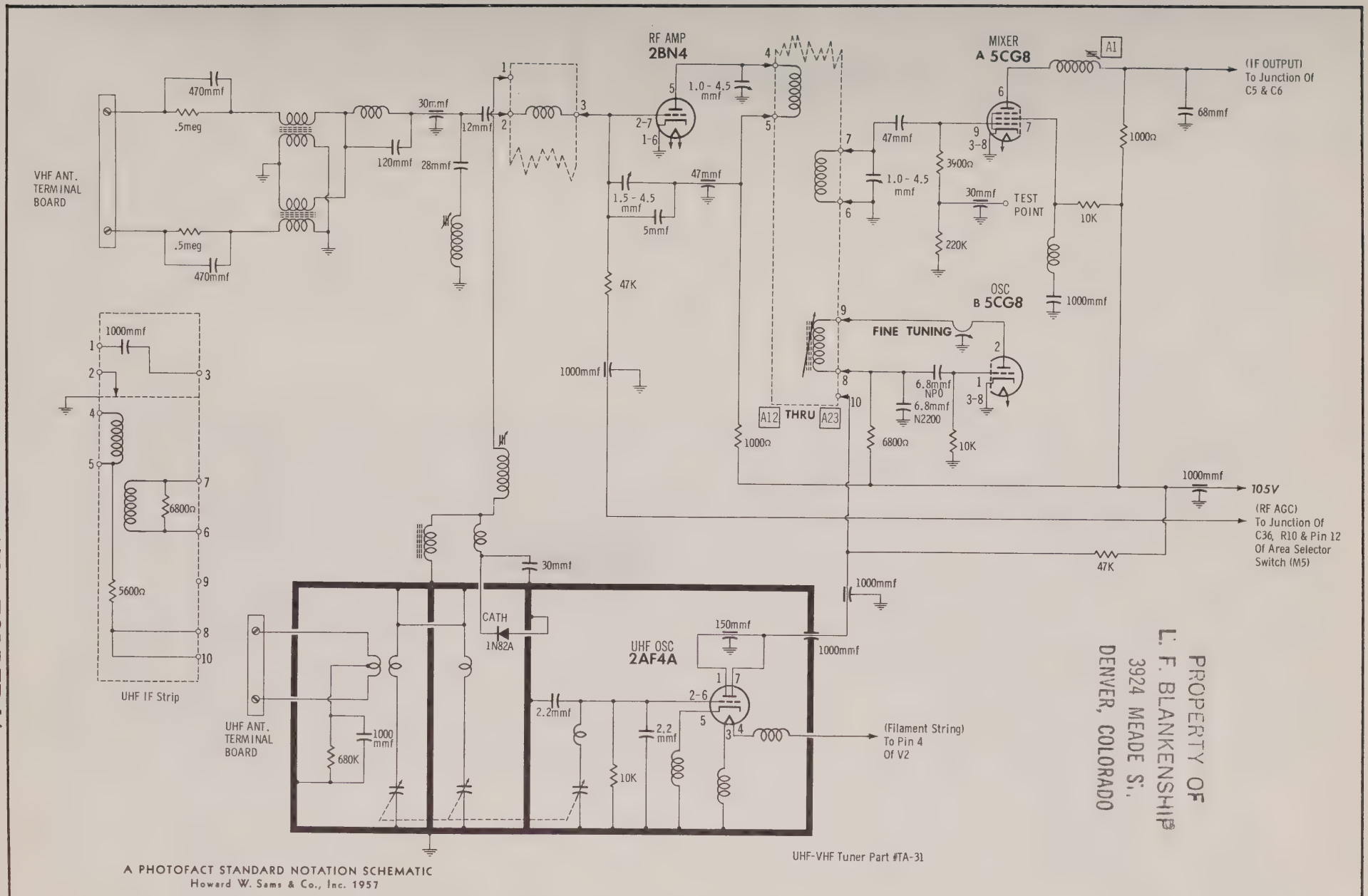
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	1.1Meg	1.5Ω	2Ω	†1500Ω	0Ω	1.1Meg		
V2	5CG8	10K	†7300Ω	0Ω	0Ω	1.5Ω	†1500Ω	†10K	0Ω	220K
V3	3AU6	1.1Meg	0Ω	4.5Ω	5.5Ω	†900Ω	†900Ω	33Ω		
V4	6AW8A	0Ω	2.2Meg	†15K	7Ω	5.5Ω	100Ω	1Meg	†900Ω	†900Ω
V5	6AW8A	22K	1.2Meg	†60K	8.5Ω	7Ω	220Ω	.1Ω	†900Ω	†900Ω
V6	6AW8A	0Ω	• 1.3Meg	• ‡1.3Meg	3Ω	4.5Ω	• 800Ω	2.2Meg	†23Ω	†5600Ω
V7	3AU6	1.3Ω	0Ω	9.5Ω	8.5Ω	†26Ω	†100K	560Ω		
V8	3DT6	5.2Ω	680Ω	9.5Ω	10.5Ω	‡490K	†6800Ω	560K		
V9	12L6GT	NC	13Ω	†1400Ω	†1000Ω	0Ω	NC	10.5Ω	180Ω	
V10	12W6GT	TP	13Ω	†268Ω	†23Ω	1Meg	NC	16Ω	• 550Ω	
V11	6SN7GTB	1Meg	†5600Ω	1000Ω	168K	8200Ω	68K	17.5Ω	16Ω	
V12	6SN7GTB	268K	†7000Ω	1200Ω	• 140K	‡122K	1200Ω	19Ω	17.5Ω	
V13	25CD6GA	NC	25Ω	0Ω	TP	750K	TP	19Ω	†1000Ω	TOP CAP ‡16Ω
V14	12AX4GTA	NC	NC	INF	NC	†23Ω	NC	25Ω	28Ω	
V15	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡635Ω
V16	21AUP4A	2Ω	2200Ω	PIN 6 ‡26Ω	PIN 10 ‡26Ω	PIN 11 • 165K	PIN 12 3Ω			

† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V14.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

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L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

ALTERNATE TUNER SCHEMATIC

TRAV-LER MODELS 621-300, U, 621-302, U
(Ch. 631-36, 631-56, 632-36, 632-56)

SET 372 FOLDER 14

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	2BN4	
V2	Mixer-Osc.	6CG8	
V3	1st Video-IF Amp	3AU6	
V4	2nd Video-IF Amp - Sync Sep	6AW8A	
V5	3rd Video-IF Amp - Noise Canceller	6AW8A	
V6	Video Output - Vert Osc	6AW8A	
V7	Sound IF Amp	3AU6	
V8	Audio Det	3DT6	
V9	Audio Output	12L6GT	
V10	Vert Output	12W6GT	
V11	Sync Amp -Horiz AFC	6SN7GTB	
V12	Horiz Mult	6SN7GTB	
V13	Horiz Output	25CD6GA	
V14	Damper	12AX4GTA	
V15	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA			NOTES
	TRAV-LER PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V16	21AUP4A	21AUP49 21ALP44 ① 21AUP4	21AUP4A/ 21AUP49 ① ② 21AVP4A, 21AVP49 ②	① Aluminized ② Silver screen "BS"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA					
	CAP	VOLT	TRAV-LER PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	250	150	KC-47	PRS-012		WT320	CDD-T- 1015	CD5- MT-1550	RS398 *
B	200	150						TMD-1550	
C2A	50	150	EC-24A	PRS150V5050	BBR0515	TCD49	TDLD-9		TVA-2453
B	50	150							
C3	10	75	KC-11	PRS10V10	BBR10-90	TC42	TD-10-150	FM-1510	TVA-1406
C4	200	25	EC-49	PRS25Y250	BR2503	TC50025	TD-250-25	MTH-2525	TVA-1208

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	68		CC-31		DE-680	CY5G68	ED-68		MB-468	10%
C6	1000			BPD-001	DD-102	BYA6D1	ED-1000	DCS2I	SHK-D8	
C7	330			SI 330	DE-331	CY5T33	ED-330	UC-5333	5GA-T33	
C8	330			SI 350	DE-331	CY5T33	ED-330	UC-5333	5GA-T33	
C9	1000			BPD-001	DD-102	BYA6D1	ED-1000	DCS2I	SHK-D1	
C10	680			BPD-00068	DD-681	BYA1DT68	ED-680	UC-5368	5GA-T68	
C11	680			BPD-00068	DD-681	BYA1DT68	ED-680	UC-5368	5GA-T68	
C12	1000			BPD-001	DD-102	BYA6D1	ED-1000	DCS2I	SHK-D1	Note 1
C13	4.7		CC-45	NPO-4I 4.7	TCZ-4R7	CT4A5Y4C	TCO-4.7	ZT-4547	5TCCB-V47	
C14	3.0			NPO-4I 3.0	TCZ-3	CT4A5Y2C	TCO-3	ZT-353	5TCCB-V3	
C15	.01	600		BPD-01	DD-103	CUB6B3	ED-01	GEM-613	5TM-S2	
C16	5000			BPD-005	DD-503	BYA1DD5	ED-005	DCS35	5HK-D5	
C17	100			SI 100	DE-101	LY5T1	ED-100	UC-531	5GA-T1	
C18	.1	600		BPD-104	DF-104	CUB6P1		GEM-601	5TM-P1	
C19	10			NPO-4I 10	TCZ-10	CT4S4C	TCO-10	ZT-541	5TCC-Q1	NPO
C20	.1	600		P588N-1	DF-104	CUB6P1		GEM-601	5TM-P1	
C21	4.7		CC-15	NPO-4I 4.7	TCZ-4R7	CT4S4Y4C	TCO-4.7	ZT-5547	5TCCB-V47	
C22	5000			BPD-005	DD-503	BYA1DD5	ED-005	DCS25	5HK-D5	
C23	5000			BPD-005	DD-503	BYA1DD5	ED-005	DCS25	5HK-D5	
C24	5000			BPD-006	DD-503	BYA1DD5	ED-005	DCS25	5HK-D5	
C25	15		CC-48	NPO-4I 15	TCZ-15	CY5Q5C	TCO-15	CY5C-Q15	5TCC-Q15	NPO 10%
C26	.05	200		BPD-03	DD-503	CUB3B2	ED-02	GEM-613	5TM-S2	
C27	5000			BPD-005	DD-503	BYA1DD5	ED-005	DCS25	5HK-D5	
C28	5000			BPD-005	DD-503	BYA1DD5	ED-005	DCS25	5HK-D5	
C29	.01	600		P588N-1	DF-104	CUB6P1		GEM-601	5TM-P1	
C30	470			1488-00047	DD-471	SWD74T	ED-470	UC-5547	1FM-247	
C31	.01	600		BPD-03	DD-303	CUB6B3	ED-03	GEM-613	5TM-S2	
C32	.01	600		BPD-01	DD-103	CUB6B1	ED-10000	GEM-611	5TM-S1	
C33	4700			BPD-0047	DD-473	BYA1DD47	ED-0047	DCS347	5HK-D47	
C34	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C35	1000			BPD-001	DD-102	BYA6D1	ED-001	DCS2	5HK-D1	
C36	.05	200		BPD-05	DF-503	CUB3B5		GEM-215	5TM-S5	
C37	5000			BPD-005	DD-503	BYA1DD5	ED-005	DCS25	5HK-D5	
C38	4700			1488-0047	DD-472	1WSD47	ED-0047	UC-5347	1FM-247	
C39	.01	600		BPD-01	DD-103	CUB6B1	ED-.01	GEM-611	5TM-S1	
C40	4700			1484-0047		1R5D47			MB-247	10%
C41	.05	300		P288N-35		CUB2P35		GEM-2025	2TM-P25	
C42	.02	600		BPD-02	DD-203	CUB6B2	ED-02	GEM-613	5TM-S2	
C43	3300			1488-0022	DD-222	1WSD22	ED-0022	UC-5322	1FM-222	
C44	680			BPD-00068	DD-681	BYA1DT68	ED-680	UC-5368	5GA-T68	
C45	1000			SI 1000	DE-102	LY6D1	ED-1000	DCS2I	5HK-D1	
C46	.02	600		BPD-02	DD-203	CUB6B2	ED-02	GEM-613	5TM-S2	
C47	1000			SI 1000	DE-102	LY6D1	ED-1000	DCS2	5HK-D1	
C48	.25	200		P288N-25		CUB2P25		GEM-2025	2TM-P25	
C49	.01	600		BPD-01	DD-103	CUB6B1	ED-.01	GEM-611	5TM-S1	
C50	3900			1484-0039		1R5D39			MB-239	10%
C51	1000			SI 1000	DE-102	LY6D1	ED-1000	DCS2I	5HK-D1	
C52	005	600		BPD-006	DD-503	CUB5D6	ED-5000	GEM-625	5TM-D5	
C53	470			1489-00047	DE-471	SR5Y47	ED-470	MC2343	5HK-D47	10%
C54	.25	200		P288N-25		CUB2P25		GEM-2025	2TM-P25	
C55	33	6000	CC-47							10%
C56	.25	200		P288N-25		CUB2P25		GEM-2025	2TM-P25	
C57	.02	600		P588N-22		CUB6P22		GEM-6022	6TM-P22	Note 2
C58	47	1500	CC-37	BVD-15-47	DD50-470	BVA15Q47	HK85-47	DC30947	15GAB-Q47	
C59	56	2000			DD50-560	HV A20Q56	HD8-56	DC30456	7GA-Q56	Note 3
C60	.05	600		BPD-05	DF-503	CUB5B5		GEM-615	6TM-S5	
C61	5000			BPD-005	DD-503	BYA1DD5	ED-005	DCS25	5HK-D5	
C62	1000			BPD-001	DD-103	BYA6D1	ED-1000	DCS2I	5HK-D1	
C63	1000			BPD-001	DD-102	BYA6D1	ED-1000	DCS2I	5HK-D1	
C64	.1	600		P588N-1	DF-104	CUB6P1		GEM-601	6TM-P1	

Note 1. Some versions may use 5000MMF in this application.
Note 2. Some versions may use .25MFD in this application.
Note 3. Some versions may use 47MMF ② 1500V in this application.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRAV-LER PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No.	
R1A	1Meg	↓	VC-51	B-70	A47-1Meg-Z	Q33-1J7	U33	Volume
B	Shaft			Not Req.	KS6-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	TS-1	US-38	
R2A	1.5Meg	↓	VC-53	AB-742	A47-1.5Meg-S	Q1-338	TA65L	Vert. Hold
B	Shaft			AK-4	KS6-3	Not Req.	Not Req.	
R3A	50K	↓	VC-72	B-31	A47-50K-S	Q1-132	TA54L	Horiz. Hold
B	Shaft			Not Req.	KS6-3	Not Req.	Not Req.	
R4A	1000Ω	↓	VC-61	AB-5	A47-1000-S	Q1-108	TA31L	Picture Contrast
B	Shaft			AK-4	KS6-3	Not Req.	Not Req.	
R5A	350K	↓	VC-74	AB-59	A47-300K-S	Q1-134		Brightness
B	Shaft			AK-19	RN-3	TQ		
R6A	2.5Meg	↓	VC-75	AB-83	A47-2.5Meg-S	Q1-329	SU-966	Vert. Size
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R7A	750Ω	↓	VC-77	AB-6	A47-750-S	Q1-105	PTA35L	Vert. Lin.
B	Shaft			AK-19	RN-3	TQ	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	TRAV-LER PART No	IRC PART No.		
R8	820K					
R9	1Meg 5%					
R10	100K					
R11	820Ω					
R12	430Ω 5%			BTS-430 5%	Note 1	
R13	33Ω			BTS-33		
R15	6200Ω					
R16	430Ω 5%			BTS-430 5%	Note 1	
R17	100Ω			BTS-100		
R18	15K			BTS-15K		
R19	430Ω 5%			BTS-430 5%	Note 1	
R20	220Ω			BTS-220		
R21	6800Ω			BTS-6800		
R22	330Ω			BTS-330		
R23	1Meg 5%			BTS-1Meg 5%		
R24	2.5Meg			BTS-2.5Meg		
R25	56K			BTS-56K		
R26	5600Ω	2		BTS-5600		
R27	68K			BTS-68K		
R28	150K			BTS-150K		
R29	100K			BTS-100K		
R30	560Ω			BTS-560		
R31	6800Ω			BTS-6800		
R32	180K			BTS-180K		
R33	560K			BTS-560K		
R34	390K			BTS-390K		
R35	100K			BTS-100K		
R36	680Ω			BTS-680		
R37	180Ω			BTS-180		
R38	220K			BTS-220K		
R39	560K			BTS-560K		
R40	22K			BTS-22K		

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRAV-LER PART No	IRC PART No.	
R41	2.2Meg				
R42	15K				
R43	1Meg 5%				
R44	5600Ω				
R45	1000Ω				
R46	820K 5%				
R47	4700Ω				
R48	2200Ω				
R49	1Meg				
R50	47K	1			
R51	220Ω				
R52	1800Ω				
R53	560Ω				
R54	100K				
R55	100K				
R56	3300Ω				
R57	68K				
R58	4700Ω				
R59	33K				
R60	5800Ω				
R61	100K				
R62	22K				
R63	100K	1			
R64	1300Ω				
R65	220K				
R66	680K				
R67	680K				
R68	1000Ω 5%	1			
R69	15Ω				
R70	2.2Ω 5%				
R71	470Ω	2	WR-21	BTA-4700	
R72	470Ω	1		BTA-470	
R73	5.6Ω		F-6	FR5.6	

Note 1. Some versions may use a 470Ω, 5% in this application.
Note 2. Some versions may use a 1Meg in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA								NOTES
		TRAV-LER PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	
T1	Vert Osc	TR-22	B6702	A-3003	209T1 ↓	V403	A-8125	26A03	A-97X	
T2	Vert Output	TR-21	Z1900 ②	A-2922 ↓		V314 ↓	A-8114 ↓	26B3 ↓	A-108X ↓	
T3 A	Yoke-Horiz. (20.5MH) (70°)-Vert (35.5MH)	L-71-1	DF905 ④ ⑤ ⑥	MDF-73 ④ ⑤ ⑥	222DA ④ ⑤ ⑥	Y70F20/43 ④ ⑤ ⑥	DY-11A ④ ⑤ ⑥	Y-10 ④ ⑤ ⑥	Y-22 ④ NW2 YCL ④ ⑤ ⑥	
	All Yoke	L-71	DF605 ④ ⑤ ⑥	MDF-73 ④ ⑤ ⑥	222DA ④ ⑤ ⑥	Y70F20/43 ④ ⑤ ⑥	DY-11A ④ ⑤ ⑥	Y-10 ④ ⑤ ⑥	Y-22 ④ NW2 YCL ④ ⑤ ⑥	
T4	Horiz Output	TR-20	FB419 * ↓ ⑥	HVO-87 ⑦ ⑧	23571 *⑦ ⑧	X093 * ⑦ ⑧	A-8280 * ⑦ ⑧	FLY-16 * ⑦ ⑧	D-95 * ⑦ ⑧	

① Drill new mounting hole(s).
② Use 6 to 1 turns ratio
③ Connect blue lead to plate, green or black lead to yellow lead of yoke, remove black lead of yoke from ground, connect black lead of yoke and red lead of transformer to B+ and pin 4 of vertical output.
④ Use original horizontal damping network, if necessary a new centering device is required.
⑤ Connect same as original.
⑥ Connect horizontal damping capacitor (C59) across yoke terminals 4i and 42.
⑦ Use original mounting bracket.
* This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	9	9	4	9	2	3	9	5
	8	7	9	7	1	2	7	4
	7	7	7	7	6	2	7	4
	6	NC See Note ③	2	NC See Note ③	4	NC See Note ③	NC See Note ③	YCT
	5	1	1	1	7	1	1	1
Special Notes →		⑤ ⑨		⑤ ⑨	⑨	⑨	⑤ ⑨	

⑤ To reduce yoke "ringing", remove capacitor (C59) from horizontal yoke terminals 4i and 42, and connect it, (in series with 1000Ω, 5W) across horizontal yoke terminals 42 and 47.
⑨ Filament requires 2 turns.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI	SEC	TRAV-LER PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	
T5	4400Ω	3-4Ω	AT-16 ↓	Z1907	A-2930	A-3880	24B80	S-51X	① Alternate Part AT-18

SPEAKER

ITEM No	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C IMP	TRAV-LER PART No	QUAM PART No.	
SP1	5" 6"X 9"	PM PM	3-4Ω 3-4Ω	SPK-38A ↓ SPK-45 ②	5A0T 6QA2	① Used in Models 621-300, U ② Used in Models 631-302, U

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		TRAV-LER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No	
L1	1st Video IF	L-76				
L2	2nd. Video IF	L-95				
L3	3rd. Video IF	L-96				
L4	4th. Video IF	L-94	17-4534	TV-130	6329	
L5	RF Choke	L-85	19-1005	RC-868	6613	9.2 Microhenries
L6	Series Peaking Coil	L-97	19-1068	TV-186	6172	68 Microhenries
L7	Series Peaking Coil	L-98	19-3300 *	TV-190 *	6133 *	330 Microhenries wound on 27K resistor
L8	Shunt Peaking Coil	L-65	19-3860		6148	680 Microhenries
L9	4.5MC Trap	L-103	20-1004	TV-151	1460	
L10	1st. Sound IF	L-77	17-3400 ▲		1470 ▲	
L11	2nd. Sound IF	L-80				
L12	Quadrature Coil	L-79	20-1005	TV-131	1480	

* Parallel with 27K resistor
▲ Drill mounting hole

TRANSFORMER (HORIZ. OSC.)

ITEM No	DC RES		REPLACEMENT DATA							NOTES
	PRI	SEC	TRAV-LER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Ram PART No	Thordarson PART No	
L13	165Ω		L-64	18-1576 ▲	TV-165* ▲	6210			HB-5a	30.8 to 42 Millihenries

* Disregard Tap
▲ Fabricate Mounting

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (@ CURRENT 1000 ^c/s)	TRAV-LER PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
L14	.230A	23Ω	8 Hy.	FC-3			20C44 ①	C-27X	

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	REPLACEMENT DATA	
			TRAV-LER PART No	REPLACEMENT DATA
K1	Ant. Isolation	.3-1Meg, 470MMF	CC-56	Centralab RC-471
K2	Ant. Isolation	.3-1Meg, 470MMF	CC-56	Centralab RC-471
K3	Vertical Integrator	3000MMF, 5000MMF, 5000MMF 22K, 820Ω, 820Ω	CC-36	Aerovox PA-110 Centralab PC-306 Cornell-Dubilier 115TM1 Erie 1603-01 Sprague V-1

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	TRAV-LER PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	280A	SR-8 ↓	1238A ①	1N1007 ②	MR350 ①	6R350A ①	350A ↓

① Selenium Type ② Germanium Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TRAV-LER PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N80	SC-1	1N80	1N80	Video Det. (Pigtail)

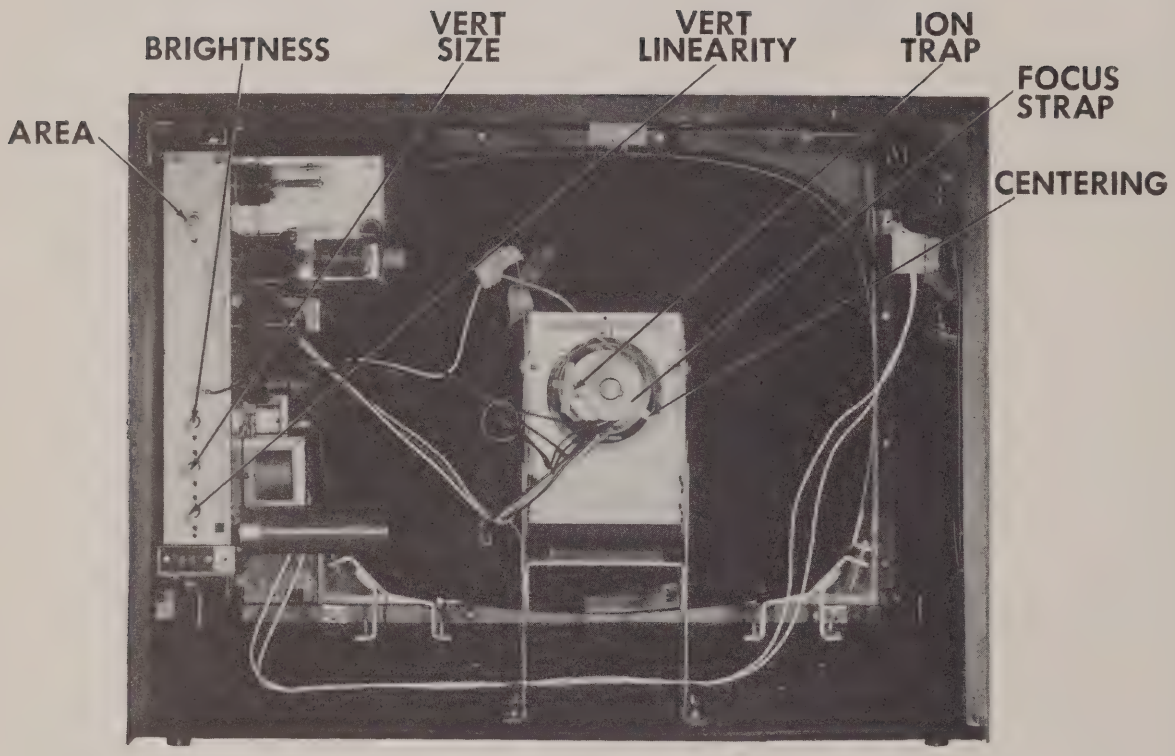
MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M3	Tuner	TA-33	VHF - Chassis 632-36
M3	Tuner	TA-31	UHF-VHF - Chassis 631-36
M4	Switch		Local-Distant - Rotary wafer type
M5	Centering Device		Includes yoke rear cover
M6	Ion Trap	MA-7	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

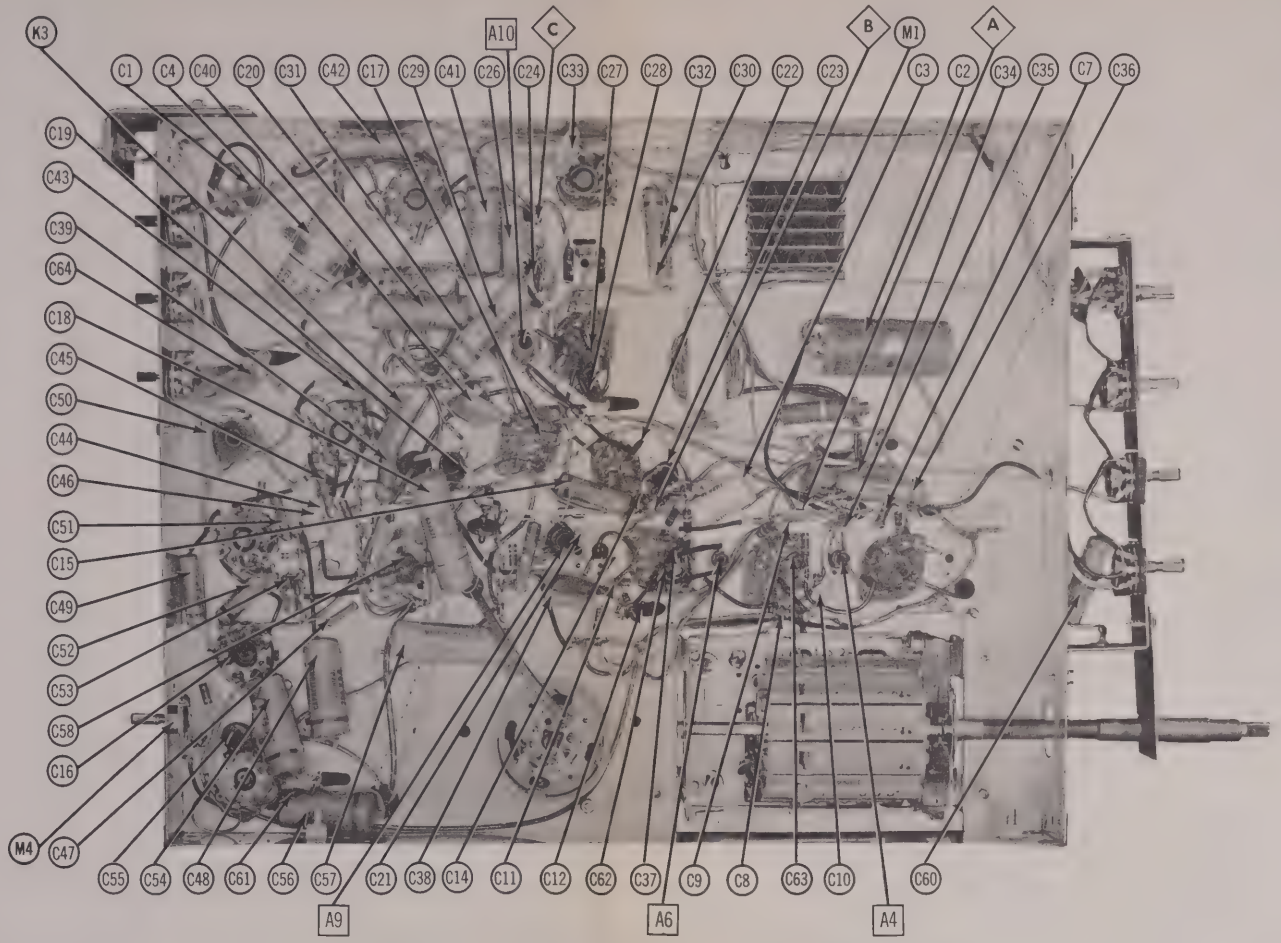
NAME	PART NO.	DESCRIPTION
Safety Glass	DW-S1T	
Mask	MP-70	
Knob	K-194	VHF Channel Selector - Models 621-300, 621-302
Knob	K-193B	VHF Channel Selector - Models 631-300U, 631-302U
Knob	K-18UB	UHF Channel Selector - Models 631-300U, 631-302U
Knob	K-195	Fine Tuning - Models 621-300, 631-302
Knob	K-189	Fine Tuning - Models 631-300U, 631-302U
Knob	K-196	Control - Models 621-300, U, 631-302, U



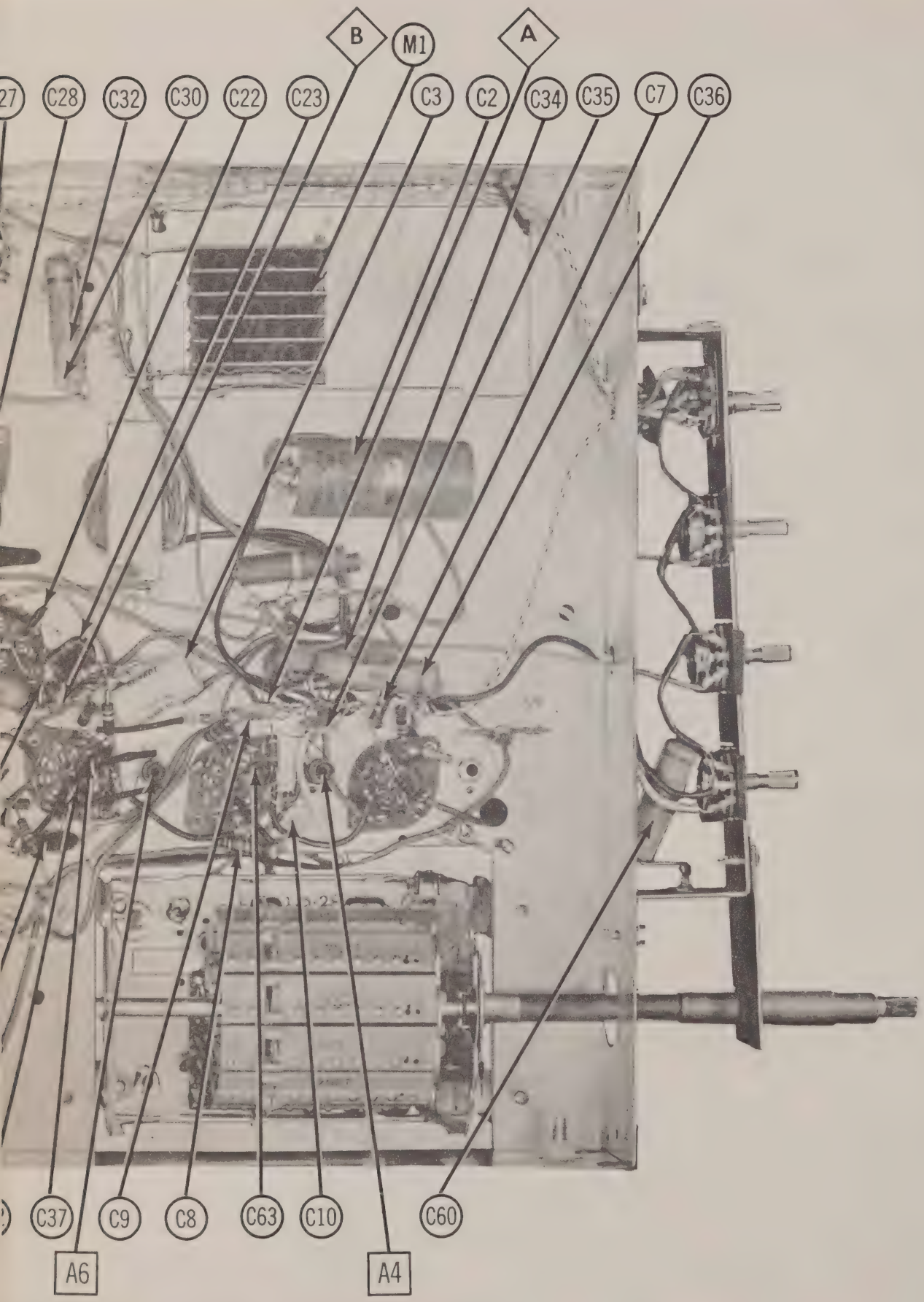
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

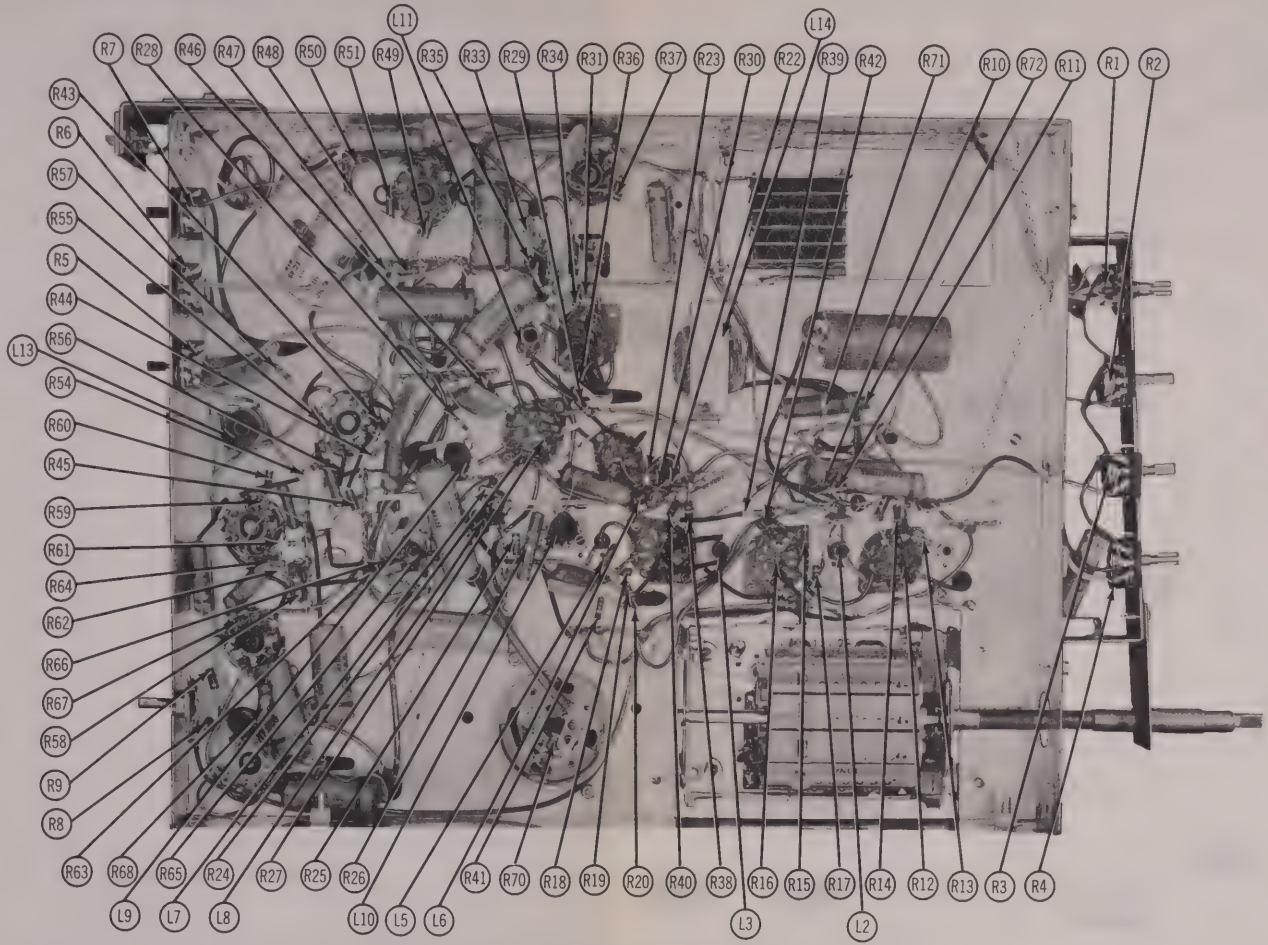
Turn the set on and tune in a TV station, preferably with a test pattern. Set the horizontal hold control at the center of its range. Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Check the lock-in action by switching off station and back again. If the picture does not pull into sync, retouch B1 until proper sync action is obtained.



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



ITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 2D1738A

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3924 MEADE ST.
DENVER, COLORADO

TRUETONE
MODELS 2D1737A, 2D1738A

TRADE NAME	Truetone Models 2D1737A, 2D1738A
SUPPLIER	Western Auto Supply Co., 2107 Grand Avenue, Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 155 Watts, 1.4 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from the front.
2. Remove 2 metal screws and the left trim plate.
3. Remove 3 push-on type control knobs.
4. Remove 5 wood screws, 1 metal screw and the rear cover.
5. Loosen 2 wood screws and remove the antenna terminal board.
6. Remove 2 speaker leads.
7. Remove 2 wood screws holding the top chassis braces to the rear of the cabinet.
8. Remove 4 cabinet bolts from the bottom.
9. Remove the chassis.
10. Remove 2 speaker nuts and the speaker.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

MODEL 2D1738A

TRUETONE
MODELS 2D1737A, 2D1738A

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs, 2 metal screws and the right hand trim plate. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 push-on type control knobs from the front. Remove 4 metal screws and the 2 trim plates. Remove 3 push-on type control knobs and the safety glass.

FOCUS

Adjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart).

FUSES

A 7.5Ω fusible resistor (R74) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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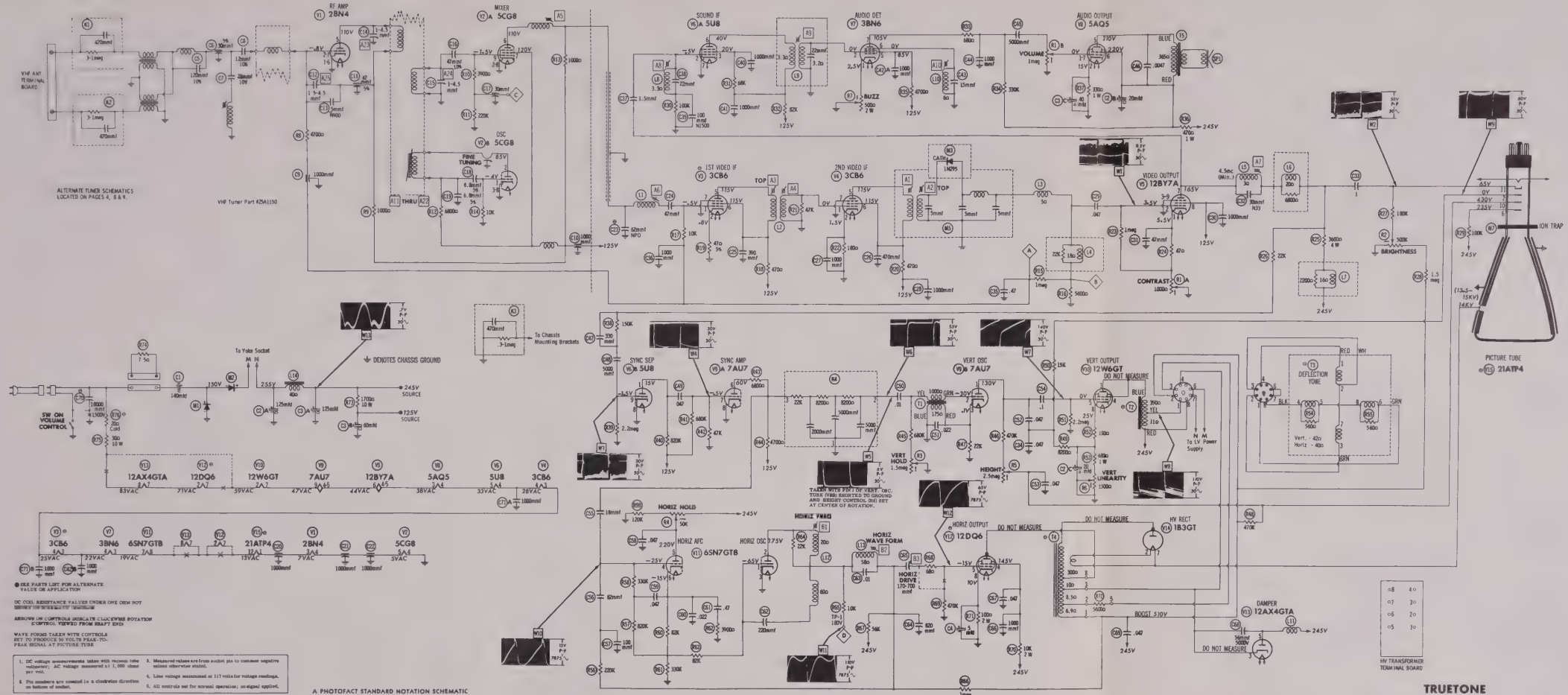

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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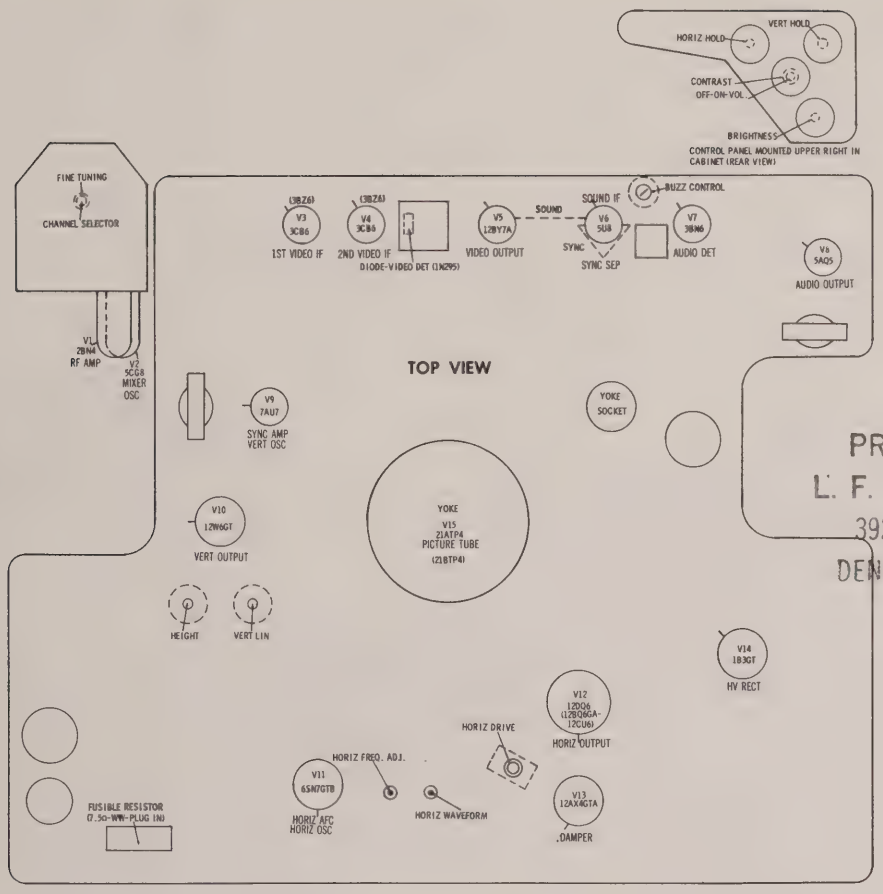
TRUETONE
MODELS 2D1737A, 2D1738A

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

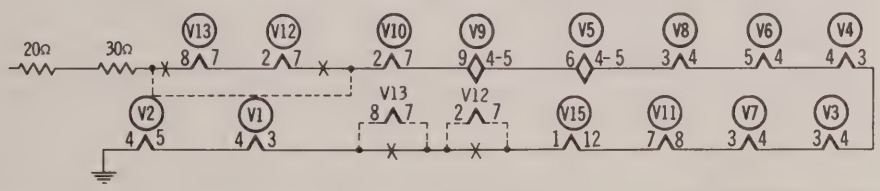
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R74), Rectifiers (M1, M2)

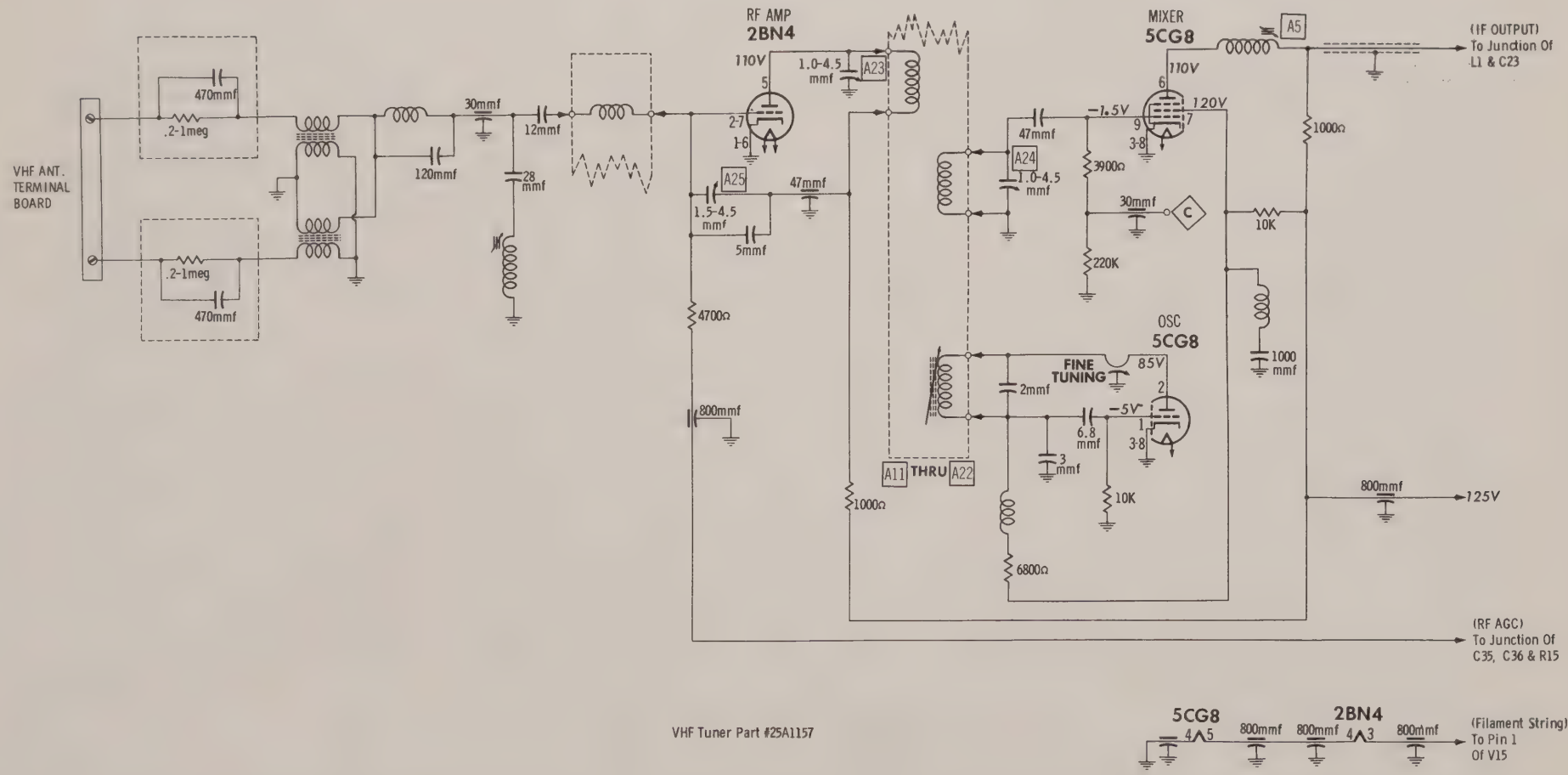
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, Diode (M3), V5
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V5, V15
Has pic, no sound - V6, V7, V8

SYNC FAILURE
No vert. sync - V6, V9
No horiz. sync - V6, V9, V11
No vert. or horiz. sync - V6, V9

SWEEP FAILURE
No raster, has sound - V11, V12, V13, V14, V15
No vertical deflection - V9, V10
Poor vert. linearity or foldover - V9, V10
Poor horiz. linearity or foldover - V11, V12, V13
Narrow picture - V11, V12, V13, M1, M2
Vert. off freq. - V9,
Horiz. off freq. - V11

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)





VHF Tuner Part #25A1157

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ALTERNATE TUNER SCHEMATIC

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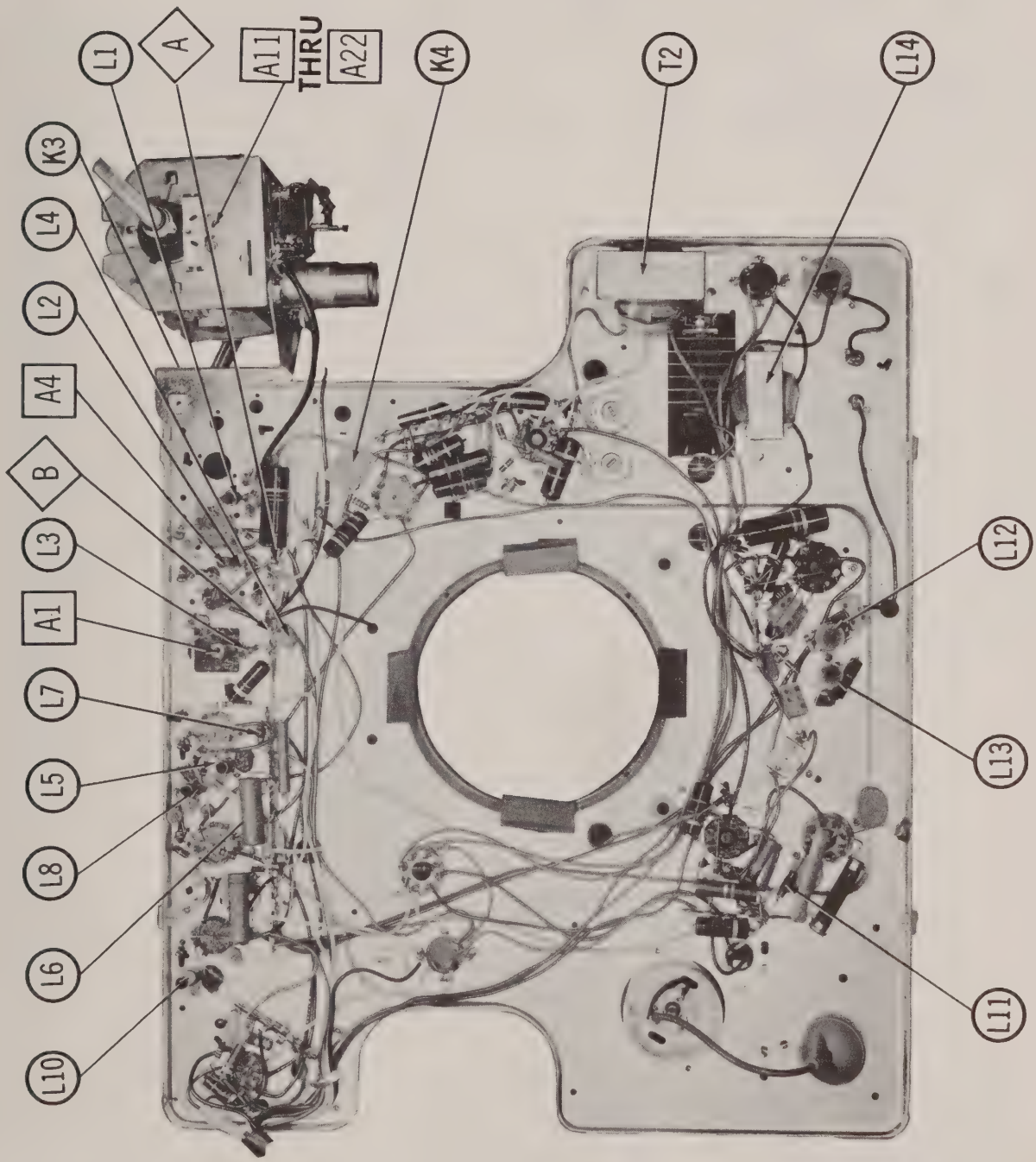


CHASSIS BOTTOM VIEW-INDUCTOR AND ALIGNMENT IDENTIFICATION

TRUETONE
MODELS 2D1737A, 2D1738A

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.

VIDEO IF ALIGNMENT

Connect the negative lead of a 5.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 2nd. Video IF tube (V4). Low side to chassis.	44.0MC (10MC Swp)	42.8MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 10K to point (B). Low side to chassis.	A1, A2	Adjust for maximum amplitude of response curve similar to Fig. 1 with markers as indicated. Increase sweep output to provide 4 volts peak to peak on scope. Readjust A1 and A2 if necessary.
2.	"	High side to pin 1 (grid) of 1st. Video IF tube (V3) Low side to chassis.	"	42.8MC 43.9MC 44.5MC 45.75MC	"	"	A3, A4	Adjust for maximum gain and symmetry of response curve similar to Fig. 2 with 45.75MC at 55% and the 43.9MC and 44.5MC markers at equal levels.
3.	1000MMF Ceramic Capacitor	High side to point (C). Low side to chassis. For UHF receivers, high side to ungrounded tube shield floating over mixer-oscillator tube (V2). Low side to chassis.	"	"	"	"	A5, A6	Adjust for maximum gain and symmetry of response curve similar to Fig. 3 with 45.75MC marker at 50%, and the 43.9MC and 44.5MC markers at equal levels. If necessary, repeat steps 1, 2 and 3 for desired curves.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.005MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to pin 11 (cathode) of picture tube. Common to chassis.	A7	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength to the receiver antenna terminals by use of an attenuator or similar device until a hiss is heard in the sound.
Adjust A8, A9, A10 and the buzz control (R7) for maximum undistorted sound and MINIMUM buzz. If the hiss disappears during alignment, further reduce the signal strength.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (B). Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

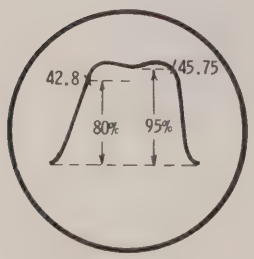


FIG.1

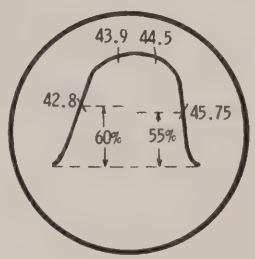


FIG.2

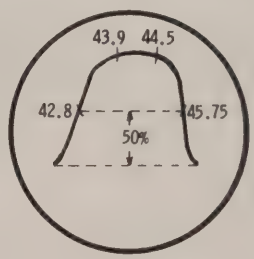


FIG.3

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT FOR TUNERS PART #25A1150, 25A1154, 25A1157

Connect the negative lead of a 1.5 volt bias supply to point (A). For Tuner part #25A1150.
Connect the negative lead of a 2.5 volt bias supply to point (A). For Tuners part #25A1154, 25A1157.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru detector (Fig. 6) to pin 5 (plate) of 1st. video IF (V3). Low side to chassis.	A23, A24	Adjust A23 and A24 for response similar to Fig. 5 with markers on shoulders of curve.
7.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	"	"	A25	Adjust for MINIMUM response curve amplitude.
8.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel, make compromise adjustment of A23 and A24 with channel switch set to that channel Check all other channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

VHF RF AND MIXER ALIGNMENT FOR TUNER PART #25A1138

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10K to point (C). Low side to chassis.	A26, A27, A28	Adjust for response curve similar to Fig. 5 with markers above 90%.
10.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel, make compromise adjustments of A26, A27 and A28 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

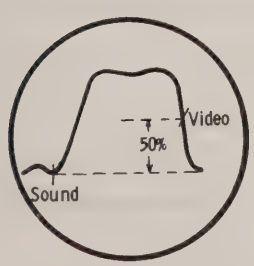


FIG. 4

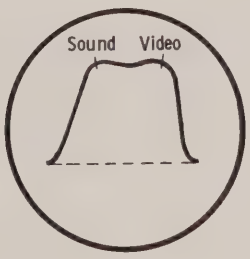


FIG. 5

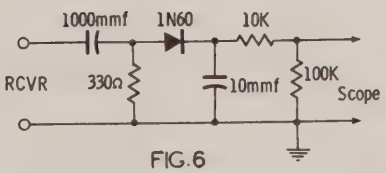
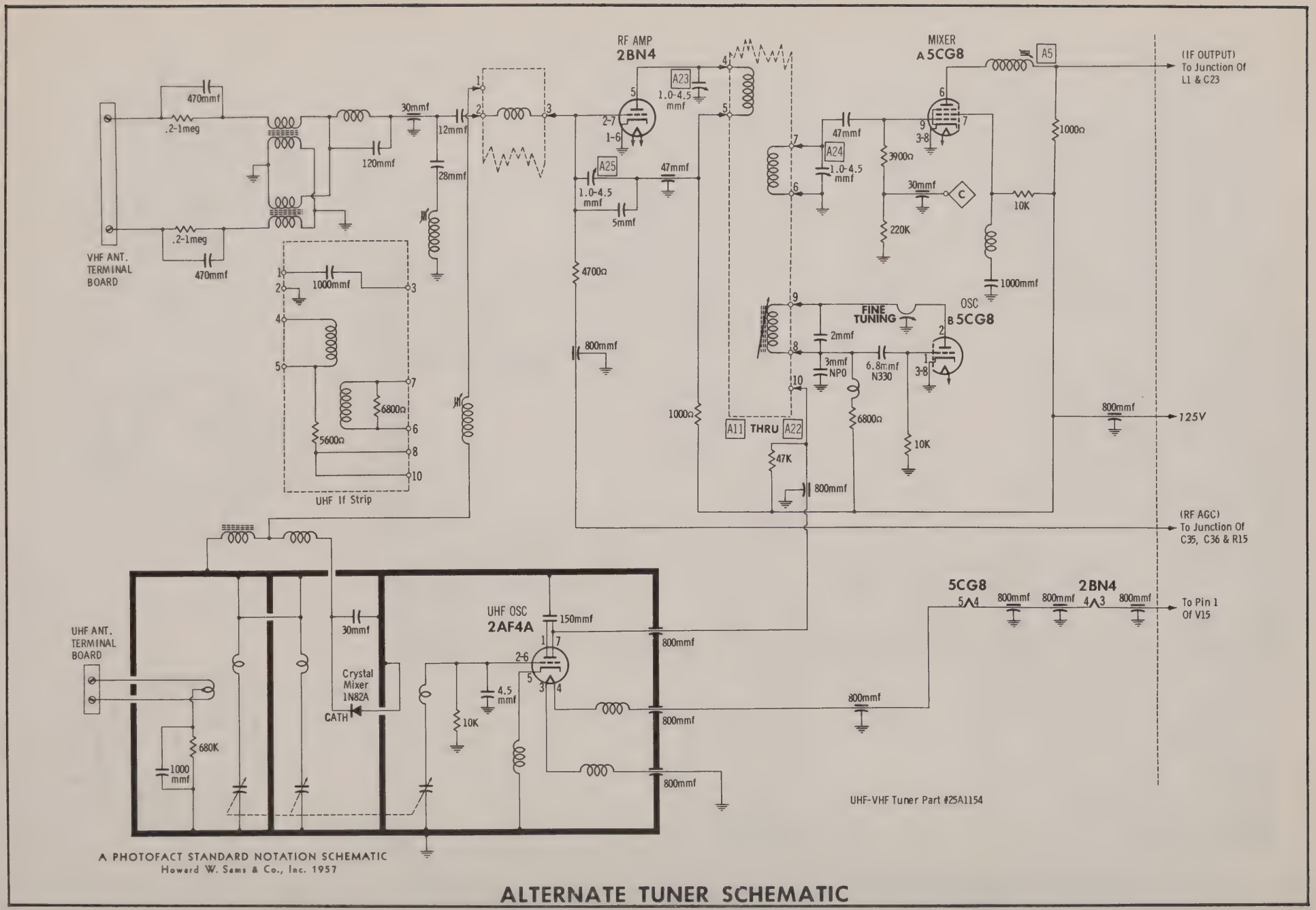
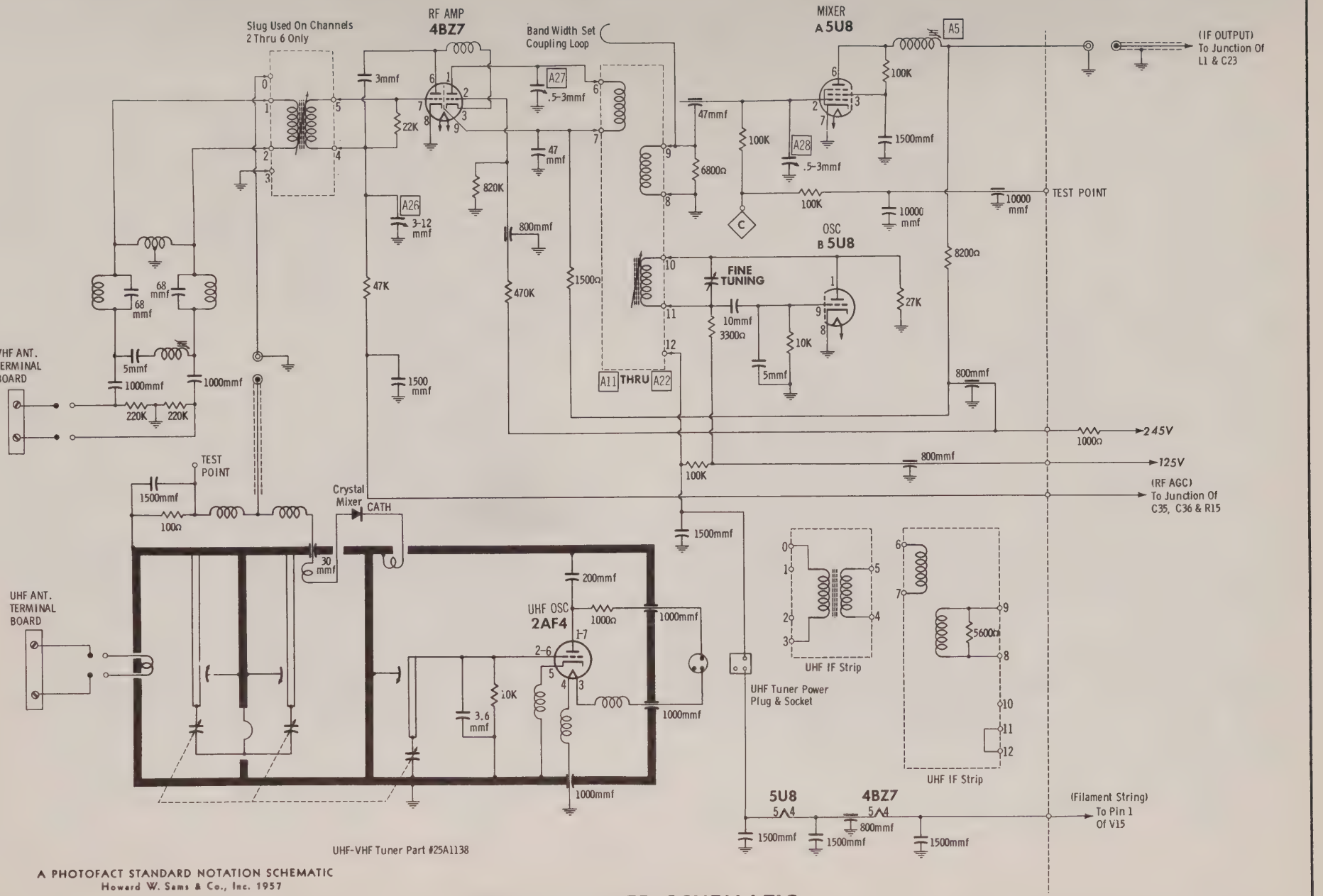


FIG. 6



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

ALTERNATE TUNER SCHEMATIC



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

ALTERNATE TUNER SCHEMATIC

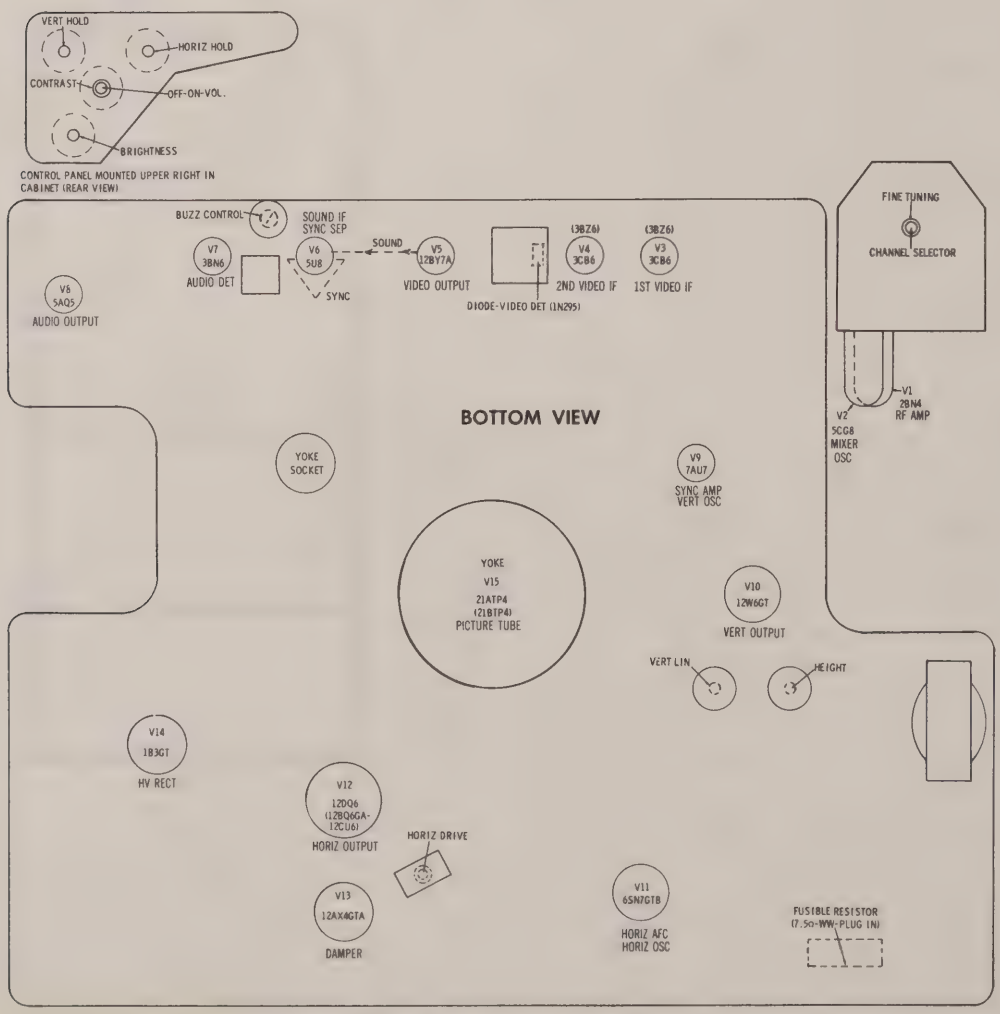
MODELS 2D1737A, 2D1738A

TRUETONE

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	1Meg	2Ω	1.5Ω	†2700Ω	0Ω	1Meg		
V2	5CG8	10K	†8500Ω	0Ω	0Ω	1.5Ω	†2700Ω	†1700Ω	0Ω	220K
V3	3CB6	1Meg	47Ω	6Ω	7Ω	†2200Ω	†2200Ω	0Ω		
V4	3CB6	.1Ω	180Ω	7Ω	8Ω	†2200Ω	†2200Ω	0Ω		
V5	12BY7A	• 450Ω	1Meg	0Ω	10Ω	10Ω	11Ω	†3700Ω	†1700Ω	0Ω
V6	5U8	†820K	100K	†150K	8Ω	9Ω	†82K	0Ω	0Ω	2.2Meg
V7	3BN6	• 350Ω	3.3Ω	5Ω	6Ω	†6400Ω	6Ω	†330K		
V8	5AQ5	0Ω	330Ω	10Ω	9Ω	†875Ω	†510Ω	0Ω		
V9	7AU7	• ‡2.3Meg	• 1.2Meg	175Ω	11Ω	11Ω	†13K	40K	0Ω	12Ω
V10	12W6GT	TP	14Ω	†400Ω	†400Ω	2.2Meg	TP	12Ω	•1100Ω	
V11	6SN7GTB	410K	†56K	0Ω	1.5Meg	• †20K	410K	3.5Ω	5Ω	
V12	12DQ6	NC	16.5Ω	TP	†10K	470K	TP	14Ω	100Ω	TOP CAP ‡10Ω
V13	12AX4GTA	TP	NC	¶	NC	†40Ω	NC	16.5Ω	18.5Ω	
V14	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡310Ω
V15	21ATP4	2Ω	• 22K	PIN 6 †100K	PIN 10 ‡470K	PIN 11 • 300K	PIN 12 3.5Ω			

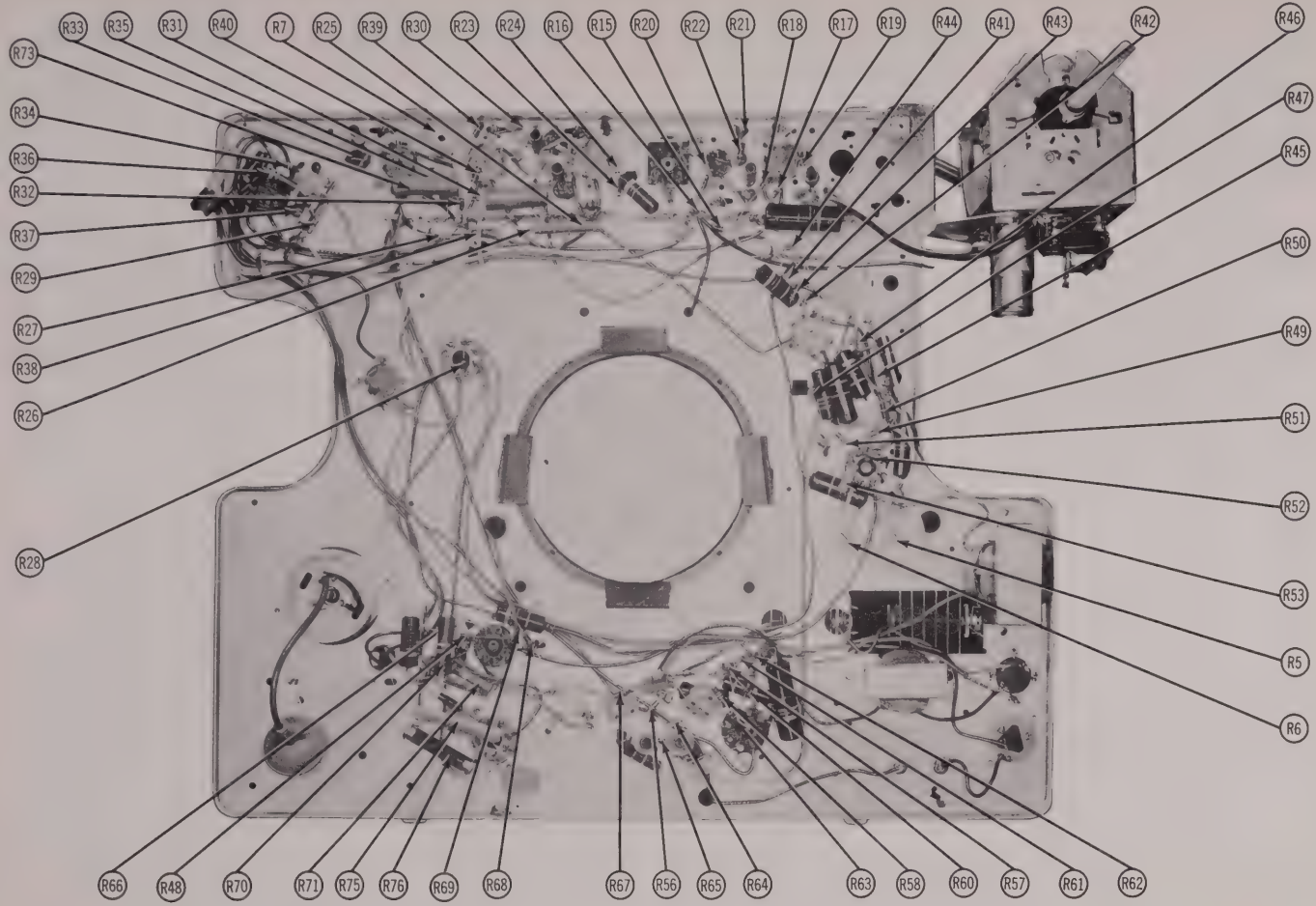
† MEASURED FROM OUTPUT OF M2.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
‡ MEASURED FROM PIN 3 OF V13.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROYLTIC CAPACITOR IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION
TP TIE POINT



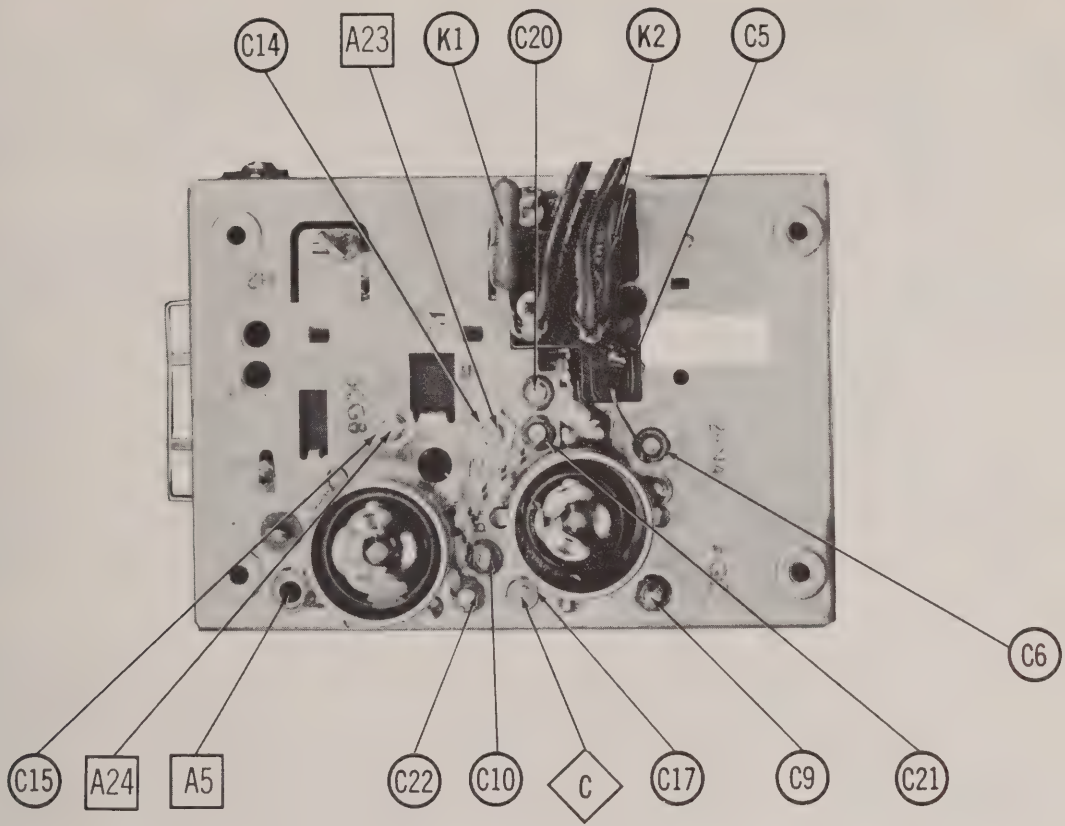
TUBE PLACEMENT CHART

CHASSIS TOP VIEW

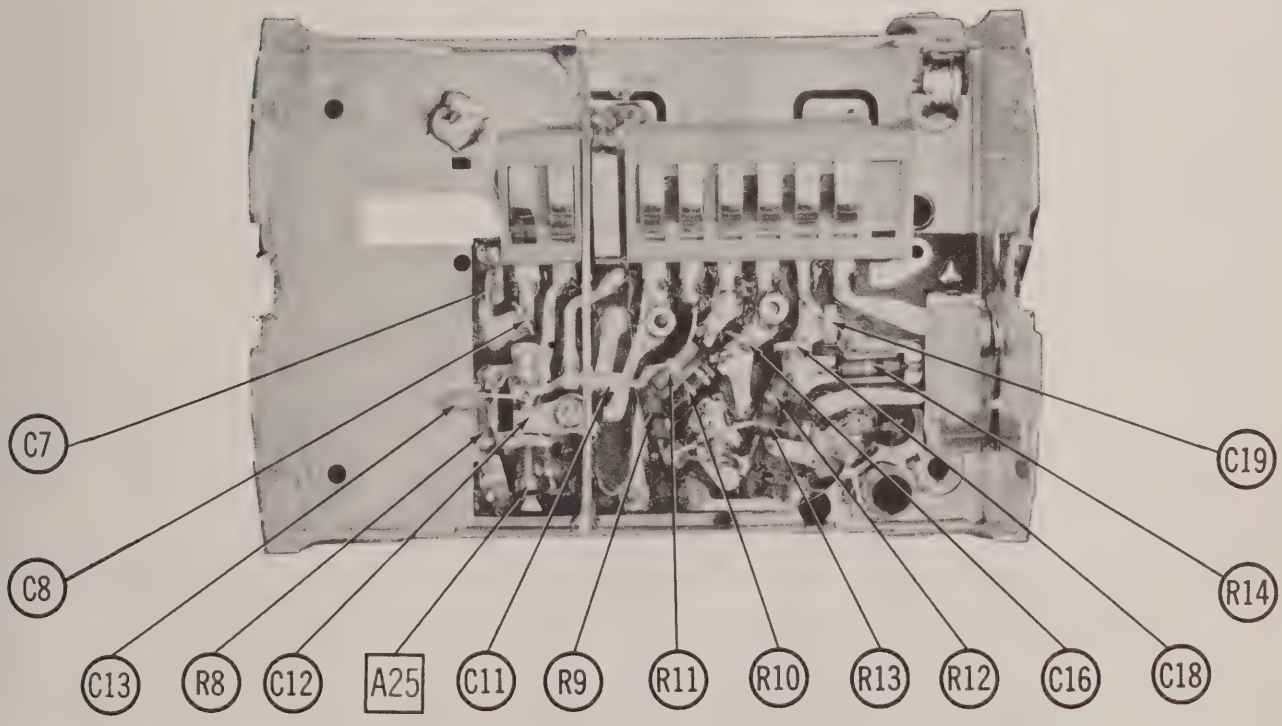
TRUETONE
MODELS 2D1737A, 2D1738A



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	3BN4	
V2	Mixer Oscillator	6CG8	
V3	1st. Video IF Amp.	3CB6	
V4	2nd. Video IF Amp	3CB6	
V5	Video Output	12BY7A	
V6	Sound IF-Sync Sep	6U8	
V7	Audio Det	3BN6	
V8	Audio Output	5AQ8	
V9	Sync Amp -Vert.Osc	7AL7	
V10	Vert Output	12W6GT	
V11	Horiz AFC-Horiz Osc.	6BN7GTB	
V12	Horiz. Output	12DQ8	Note 1
V13	Damper	12AX4GTA	
V14	HV Rectifier	1B3GT	

Note 1 Some versions may use a 12BQ6GA or 12CU8 in this application

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: TRUETONE PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	NOTES
V15	21ATP4	21ATP4A,21ATP4J	21ATP4 1 21ATP4A 2 21ATP4A 3	1 Aluminized 2 Silver screen "S 5"
	21BTP4		21BTP4 1 21BTP4 2 21ATP4V 21ATP4A 3 21ATP4A 2	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: TRUETONE PART No	AEROVOX PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1	140	150	45X431	AFH31-23	XAD451		FPU7	TMS-24	T-055	TVL-1438
C2A	433	300	45X431	AFH4-03-E	DO330		FPU8		Q-07	R2376 *
B	440	300			BSR405		TC34		MT-0525	
C	420	50								
C3A	433	300	45X430	AFH3-99-E	DO644		FP420 28		T-415	TVL-3574.6
B	460	300			BR505		TC55		MT-0550	
C	440	50								
C4	5	50	45X418	PR550V5	BSR5-50	TC30	M15-50		MMT-0505	TR-1303

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	150					LS5T15	RD-150			10%
C6	56									5%
C7	30									10%
C8	15									10%
C9	1000			EF-001	MFT-1000				503C-D1	
C10	1000			EF-001	MFT-1000				503C-D1	
C11	47									5%
C12	1 5-			588-5		533-B				
	6.8									N900
C13	5			580-5		533-B				
C14	1-4.5			588-5		533-B				
C15	4.5			588-5		533-B				
C16	47									10%
C17	90									
C18	6.8									5%
C19	5.6									5%
C20	1000			EF-001	MFT-1000				503C-D1	
C21	1000			EF-001	MFT-1000				503C-D1	
C22	1000			EF-001	MFT-1000				503C-D1	
C23	68					C10Q33C	TCO-82			NPO ①
C24	47			HI 47		DS-470	LT6Q47	GF-47	UC-5447	SGA-Q47
C25	180					DD-181	LU7T9	ED-180	UC-5339	SGA-T59
C26	470			BPD-05047		DD-471	BYA07Z47	ED-470	UC-5347	SGA-T47
C27	1000			BPD-05		DD-102	BYA80S	ED-1000	DC521	5HK-D1
C28	1000			BPD-05		DD-102	BYA80S	ED-1000	DC521	5HK-D1
C29	.047	300		BPD-05		DF-503	CUSB347		GEM-4147	2TM-D47
C30	1000			BPD-05		DD-102	BYA80S	ED-1000	DC521	5HK-D1
C31	47			HI 47		DS-470	LT6Q47	GF-47	UC-5447	SGA-Q47
C32	33		47X3300			DF-104	CUSA3P1		GEM-401	4TM-P1
C33	.1	600		P488N-1		DF-104	CUSA3P1		GEM-401	4TM-P1
C34	.047	300		BPD-05		DF-503	CUSB347		GEM-4147	2TM-D47
C35	.47	300		P288M-47			CUSB2P47		GEM-2047	2TM-P47
C36	1000			BPD-05E		DD-102	BYA80S	ED-1000	DC521	5HK-D1
C37	1.5			MP0-HI 1.5		C10V15C	TCO-1.5		RT-5315	5TCCB-V15
C38	33		47X33	BPD-0003		DE-130	LI0Q33	ED-33	UC-5433	SGA-Q33
C39	100									N1500
C40	1000			BPD-05		DD-102	BYA80S	ED-1000	DC521	5HK-D1
C41	1000			BPD-05		DD-102	BYA80S	ED-1000	DC521	5HK-D1
C42A	1000			BPD-05E		DD-102	BYCSD2E	ED2-001	DCD521	5HK-2D1
B	1000									
C43	15			BPD-00001S		DD-150	LI0Q15	ED-15	UC-5415	SGA-Q15
C44	1000			BPD-05		DD-102	BYA80E	ED-1000	DC521	5HK-D1
C45	1000			BPD-05		DD-102	BYA10DE	ED-001	DC525	5HK-D5
C46	.0047	200		BPD-0047		DS-472	CUSB2D47	GP-4700	GEM-3247	2TM-D47
C47	330		47X370	1464-00033			SRS7Z33			MS-333
C48	1000			BPD-05E		DD-102	BYA10DE	ED-001	DC525	5HK-D5
C49	.047	400		BPD-05		DF-503	CUSB347		GEM-4147	4TM-D47
C50	.01	400		BPD-01		DF-103	CUSB3D1	GP-10000	GEM-4101	4TM-S1
C51	.022	200		BPD-03		DF-303	CUSB323	ED-03	GEM-3123	2TM-S23
C52	.047	200		BPD-05		DF-503	CUSB347		GEM-4147	2TM-D47
C53	.047	600		BPD-05		DF-503	CUSB547		GEM-4147	6TM-D47
C54	.1	600		P668M-4		DF-104	CUSA3P1		GEM-401	4TM-P1
C55	18			RCM20B180K	1464-00018		SRS7Q18			MS-618
C56	82			RCM30B820K	1464-00082		SRS7Q82			MS-682
C57	100				1464-0001		SRS7T1			MS-31
C58	047	400		BPD-05		DF-503	CUSB467		GEM-4147	4TM-D47
C59	047	200		BPD-05		DF-503	CUSB247		GEM-4147	2TM-D47
C60	022	200		BPD-03		DF-303	CUSB323	ED-03	GEM-3123	2TM-S23
C61	47	200		P268M-47			CUSB2P47		GEM-3047	2TM-P47
C62	220			1464-00022			SRS7Z3			MS-322
C63	01	400		BPD-01		DD-103	CUSB4D1	ED-01	GEM-411	4TM-S1
C64	820		RCM30B82K	1464-00082			SRS7Z8			MS-382
C65	170- 700		17A27							
C66	1000			BPD-05		DD-102	BYA80S	ED-1000	DC521	5HK-D1
C67	047	600		BPD-05		DF-503	CUSB467		GEM-4147	6TM-D47
C68	50	5000	47X755			DD60-560				75GA-Q56
C69	047	600		BPD-05		DF-503	CUSB467		GEM-4147	6TM-D47

CAPACITORS (cont)

ITEM No.	RATING: CAP	VOLT	TRUETONE PART No	REPLACEMENT DATA: AEROVOX PART No	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C70	10000	1500		DAC-27		DDE-103	HVU2B1		GEM-1B1	B1-S10
C71A	1000			DAD-2X00I		DD2-102	BYCSD2E	ED2-001	DCD521	5HK-2D1
B	1000									

1. A 100MMF is used in this application in UHF versions.

CONTROLS

ITEM No.	RATING: RESIST ANCE	WATTS	REPLACEMENT DATA: TRUETONE PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	1000Ω	1	78X29	P1-4	RV7-579 *		U8-758	Contrast
B	1Meg			R8-51	Not Req.		Not Req.	Volume
C	Switch			KH-1	Not Req		Not Req.	
R2A	500K	1	40X394	AB-59	A47-500K-S	QU-133	U50	Brightness
B	Shaft			AK-8	RS-3/16	NQ	D8-37	
R3A	1.5Meg	1	40X396	AB-742	A47-1.5Meg-S	QU-136	U55	Vert Hold
B	Shaft			AK-8	RS-3/16	NQ	D8-37	
R4A	50K	1	40X395	AB-31	A47-50K-S	QU-123	U53	Horiz. Hold
B	Shaft			AK-8	RS-3/16	NQ	D8-37	
R5A	2.5Meg	1	40X398	AB-53	A47-2.5Meg-S	QU-230	EU-585	Height
B	Shaft			Not Req	RM-3	TQ	Not Req	
R6A	1500Ω	1	40X399	AB-8	A47-1500-S	QU-109	PTA152L	Vert Lin.
B	Shaft			AK-19	RM-3	TQ	Not Req.	
R7	500Ω	2	40X397		SB-500		FL-800	Buzz - wire wound

* Disregard tap. Use only 1 section of DPST switch.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	NOTES
R8	4700Ω			BTS-4700	
R9	1000Ω			BTS-1000	
R10	3900Ω			BTS-3900	
R11	220K			BTS-220K	
R12	6800Ω			BTS-6800	
R13	1000Ω			BTS-1000	
R14	10K			BTS-10K	
R15	1Meg			BTS-1Meg	
R16	5600Ω			BTS-5600	
R17	10K			BTS-10K	
R18	4700Ω			BTS-470	
R19	470 5%			BTS-47 5%	
R20	470Ω				
R21	47K			BTS-47K	
R22	180Ω			BTS-180	
R23	1Meg			BTS-1Meg	
R24	47Ω			BTS-47	
R25	3900Ω	4			
R26	22K			BTS-22K	
R27	180K			BTS-180K	
R28	1.5Meg			BTS-1.5Meg	
R29	100K			BTS-100K	
R30	100K			BTS-100K	
R31	68K			BTS-68K	
R32	82K			BTS-82K	
R33	680Ω			BTS-680	
R34	330K			BTS-330K	
R35	4700Ω			BTS-4700	
R36	470Ω	1		BTA-470	
R37	330Ω	1		BTA-330	
R38	150K			BTS-150K	
R39	2.2Meg			BTS-2.2Meg	
R40	820K			BTS-820K	
R41	680K			BTS-680K	
R42	47K			BTS-47K	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	NOTES
R43	6800Ω			BTS-6800	
R44	4700Ω			BTS-4700	
R45	680K			BTS-680K	
R46	470K			BTS-470K	
R47	22K			BTS-22K	
R48	470K			BTS-470K	
R49	8200Ω			BTS-8200	
R50	15K			BTS-15K	
R51	2.2Meg			BTS-2.2Meg	
R52	100Ω			BTS-100	
R53	5600Ω	1		BTA-560	
R54	560Ω				
R55	560Ω				
R56	220K				
R57	820K				
R58	330K				
R59	120K				
R60	82K				
R61	330K				
R62	2900Ω				
[illegible]	82K				
R64	22K			BTS-22K	
R65	10K			BTS-10K	
R66	1Meg			BTS-1Meg	
R67	56K			BTS-56K	
R68	68Ω			BTS-68	
R69	470K			BTS-470K	
R70	10K	2		BTS-10K	
R71	1000	2		BTS-1000	
R72	5600Ω			BTS-5600	
R73	17000	10	43X294		
R74	7.5Ω		47X380	FR7 5	
R75	30Ω	10	43X395	1 5/4A-30	
R76	20Ω		43X329		Note 1

Note 1. A temperature coefficient resistor (20Ω cold).

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: TRUETONE PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Oscillator	54X00	B6702	A-3063	20YT1 ①	V405	A-8125	26A03	A-97X
T2	Vert. Output	51X173A	Z1900 ①	A-2823 ①		V302 ①	A-8148 ②	26S72 ①	A-103X ①
	Alt. Vert Output	51X173	Z1900 ①	A-2823 ①		V303 ①	A-8148 ③	26S79 ①	A-18X ①
T3A	Yoke-Horiz (24MH)	9A23S7-1C	DF501 ① ⑤	MDF-92 ⑤	225GX ① ⑤	Y90P19/43 ⑤	DY-18A ⑤	Y-18 ① ⑤	Y-41 & YW41 ①
B	(90°) Vert (40MH)								
	Alt. Yoke	9A23S7							
M8	Yoke Rear Cover & Centering Device	3A435							YCI
	Yoke Clamp	30X5U							
T4	Horiz.Output	53X358A	FB418 ⑤	HVO-36 ⑤	235T1 ① ⑤	2094 ① *	#HO-383 *	FLY-18 ① *	D-95 ① *
	Alt. Horiz. Output	53X359							

① Drill new mounting hole(s).
② Use 8 to 1 turns ratio.
③ Connect as auto transformer.
④ Cut and tape green lead.
⑤ Mount with leads cut top and connect same as original.
⑥ Use original yoke rear cover and centering device.
\# This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	9	9	9	9	8	9	5
	3	7 or 5	7 or 5	7 or 5	7 or 5	3	7 or 5	3
	2	See Note ① NC	See Note ① NC	See Note ① NC	See Note ① NC	2	See Note ① NC	YCT
	1	1	1	1	1	1	1	1
Special Notes →		①	①	①	①		①	

① Install new horizontal damping network, consisting of approximately 100MMF ③ 2KV and 1000Ω ④ 1W connected in series,across yoke terminals #1 and #2.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI	SEC	REPLACEMENT DATA: TRUETONE PART No	Halldorson PART No	Merit PART No	Stancor PART No.	Thordarson PART No	Triad PART No	NOTES
T5	5200Ω	6-8Ω	51X180	Z1900 ①②	A-3300 ① ③	A-8337 ①	26R60 ① ②	S-81X ① ③	① Drill one new mounting hole. ② Tape center tap on primary winding.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP	REPLACEMENT DATA: TRUETONE PART No.	QUAM PART No.	NOTES
SP1	5"	PM	8-8Ω	12A540	5A07BZ6E.4	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No	NOTES
L1	1st. Video IF	9A2389		TV-131	8238	
L2	2nd. Video IF	9A2390				
L3	Resonant Choke	9A2375				10 Microhenries
L4	Shunt Peaking Coil	38A33	19-3300 a		6155 a	330 Microhenries, wound on 22K resistor *
L5	4.5MC Trap	9A2366	20-1004	TV-151	1680	
L6	Series Peaking Coil	38A35	19-4400 *	TV-150 *	6152 *	350 Microhenries, wound on 6800Ω resistor
L7	Shunt Peaking Coil	38A38	19-4301 *		6154 *	250 Microhenries, wound on 3300Ω resistor
L8	1st. Sound IF	9A2356	20-1004	TV-151	1669	
L9	2nd. Sound IF	9A2368	17-3490	TV-153	6302	
L10	Quadrature Coil	9A2367	20-1005		1680	
L11	R-F Choke	9A2380	19-1001		6804	1.5 Microhenries

a Parallel with 22K resistor.
* Parallel with 6800Ω resistor
* Parallel with 3300Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI	SEC	REPLACEMENT DATA: TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Ram PART No.	Thordarson PART No.	NOTES
L12	80Ω		9A2371		TV-165	6311 *			22-T	13-63 Millihenries tapped @50Ω Horiz. Freq
L13	56Ω		9A2372						22-S *	7.5-35 5 Millihenries Horiz. Waveform

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT 1000 Cps	REPLACEMENT DATA: TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L14	.250A	60Ω	.7 HY.	51X98-3	C9037 ①	C-2996 ①	C-2326 ①	26C64 ①	C-27X

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No	REPLACEMENT DATA	
E1	Antenna Input	.3-1Meg, 470MMF	76X11		
E3	Antenna Input	.3-1Meg, 470MMF	76X11		
E3	Chassis Isolation	.3-1Meg, 470MMF	76X11		
E4	Vert. Integrator	2000MMF, 5000MMF, 6000MMF, 22K, 8200Ω, 8200Ω	78X7	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-1L0 PC-190 1HT6 1405-01 V-1

RECTIFIERS

ITEM No	RATING: CURRENT (Measured)	TRUETONE PART No	FEDERAL PART No	GENERAL ELECTRIC PART No	INTERNATIONAL PART No.	MALLORY PART No	SARKES TARZIAN PART No.	NOTES
M1	.250A	66X16 ①	1090A ①	1N1007 ②	R5300S6 ①	6S300A ①	300 ②	
M2	.250A	66X16 ①	1090A ①	1N1007 ②	R5300S6 ①	6S300A ①	300 ②	

① Selenium Type, ② Germanium Type.

TRUETONE
MODELS 2D1737A, 2D1738A

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TRUETONE PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N295 *		1N60	1N60	Video Det. (Pigtail)

* A CK706 or a 1N60 may be used in some versions.

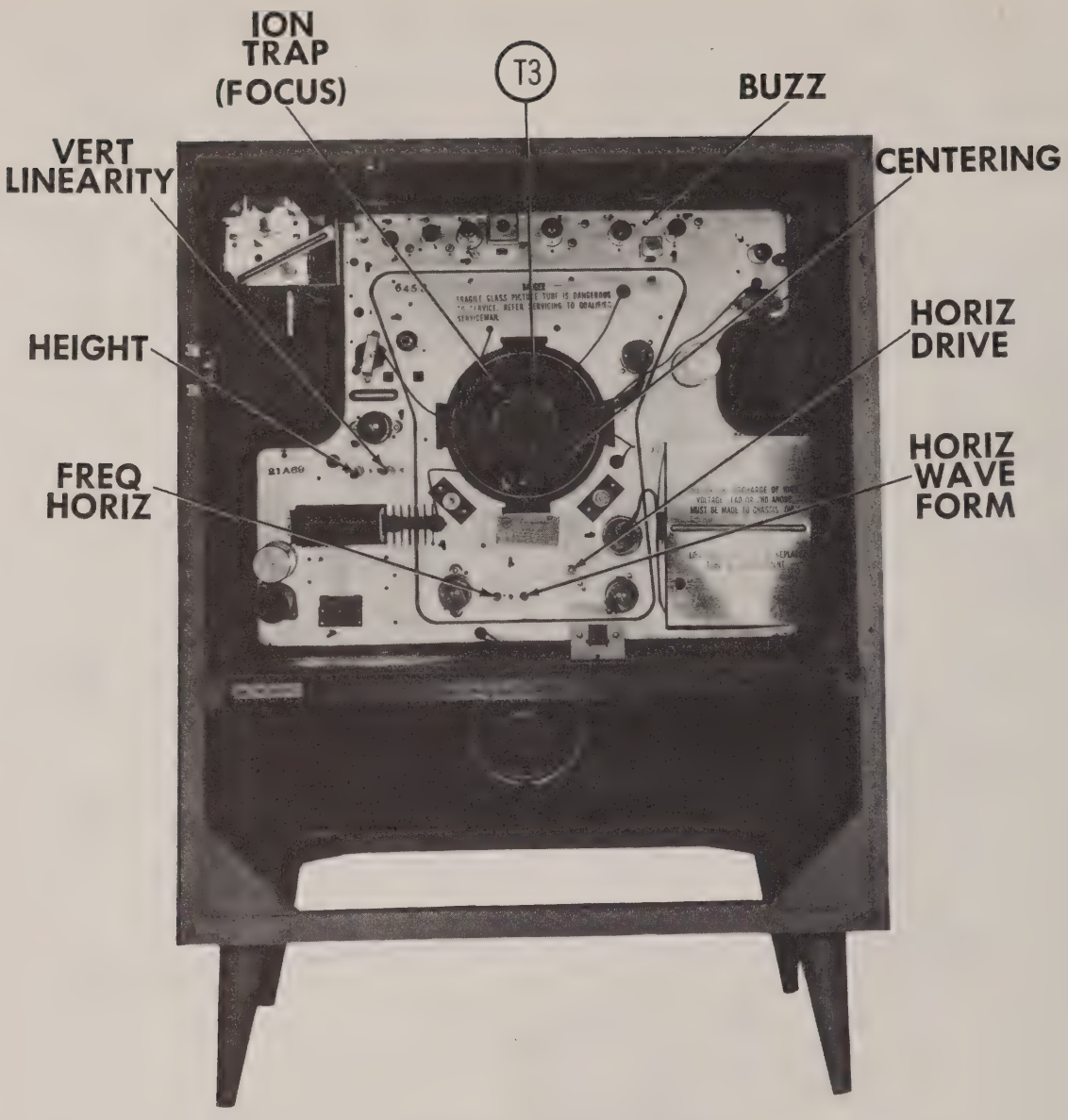
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuner	25A1150	VHF
	Tuner	25A1138	UHF-VHF
M5	Crystal Det. Assy.	9A2391	Includes 3rd. Video IF, peaking coil, caps and M3.
M6	Centering Device	2A435	Includes yoke rear cover
M7	Ion Trap	2A421	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	17X190	
Mask	4X1247-1	Gold
Mask	4X1247-2	Silver
Knob	10A856-1	Channel Selector
Knob	S-38A40	Fine Tuning
Knob	10A862-1	On-off-volume
Knob	S-38A35	Contrast
Knob	10A861-1	Control
Leg	81X4-4	Oak
Leg	81X4-5	Mahogany



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set the contrast control for normal contrast.

1. Set the horizontal hold control in the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

2. Connect the vertical amplifier of the scope to point ⓓ. Connect the low side of the scope to chassis. Adjust the horizontal waveform slug (B2) until waveform is similar to Fig. 7. While making this adjustment, keep the picture in sync with the horizontal hold control.

3. Turn the horizontal hold control fully clockwise. Turn B1 clockwise until the picture is just ready to pull-in sync.

4. Turn the horizontal hold control fully counter clockwise. The picture should remain in sync. Momentarily remove the signal by switching off the channel and back again. Retouch B1 if necessary.

5. While receiving a signal from a station, turn the contrast control fully counter clockwise and turn the brightness control up so that the picture is washed out in appearance. Turn the horizontal drive trimmer (B3) clockwise until white vertical bars appear in the left center of the raster, then slowly turn B3 counter clockwise until the white bars disappear.

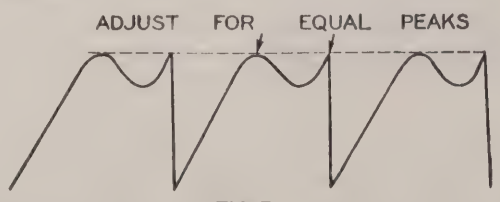
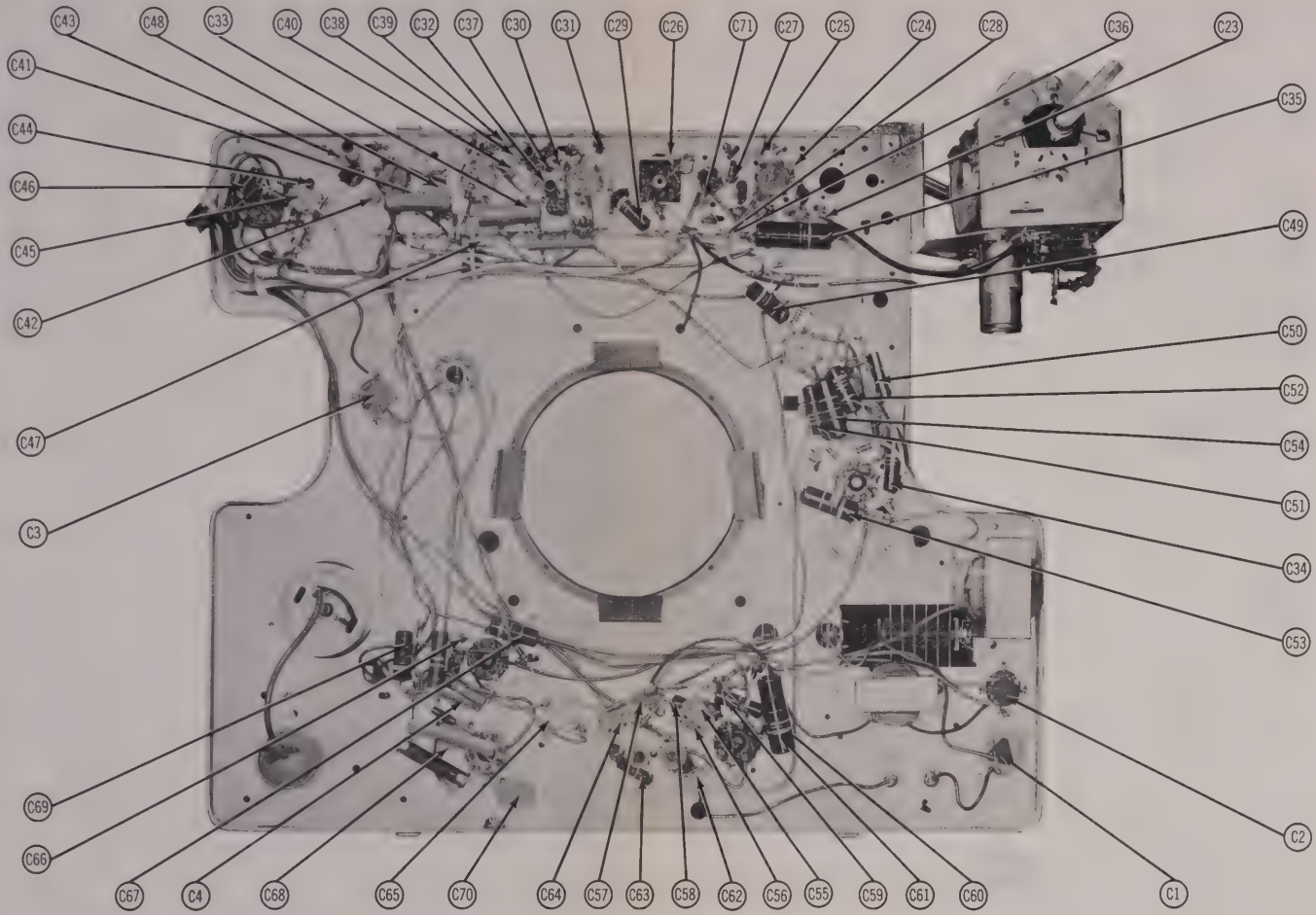
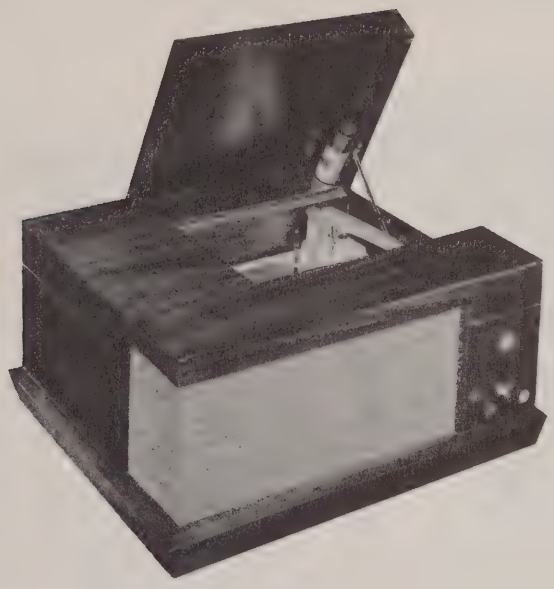


FIG. 7



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

V-M
MODELS 560A-1, -2, -3, -4



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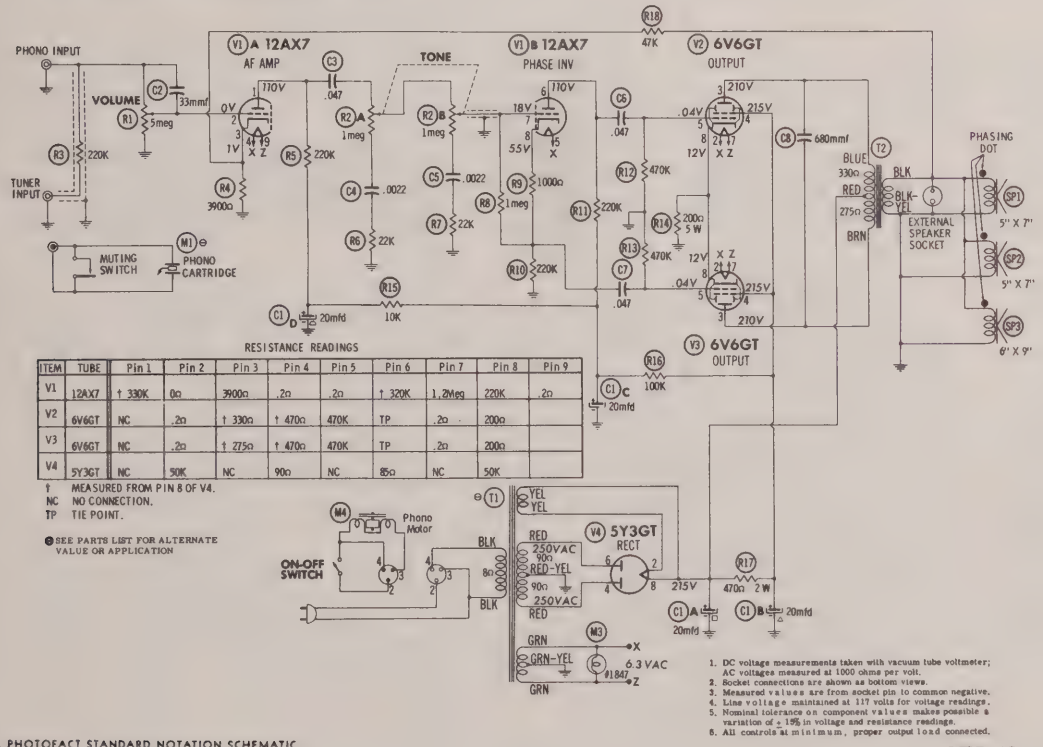
3924 MEADE ST.
DENVER, COLORADO

V-M
MODELS 560A-1, -2, -3, -4

TRADE NAME	V-M Models 560A-1, 560A-2, 560A-3, 560A-4
MANUFACTURER	V-M Corp., Benton Harbor, Michigan
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Four)	Types 12AX7 AF Amp. - Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .58 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE V-M MODEL 1200 — PHOTOFACT SET 290 FOLDER 11 OR RECORD CHANGER MANUAL CM-7.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 330K	0Ω	3900Ω	.2Ω	.2Ω	† 320K	1.2Meg	220K	.2Ω
V2	6V6GT	NC	.2Ω	† 330Ω	† 470Ω	470K	TP	.2Ω	200Ω	
V3	6V6GT	NC	.2Ω	† 275Ω	† 470Ω	470K	TP	.2Ω	200Ω	
V4	5Y3GT	NC	50K	NC	90Ω	NC	85Ω	NC	50K	

† MEASURED FROM PIN 8 OF V4.
NC NO CONNECTION.
TP TIE POINT.

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957

372-16

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp-Phase Inv	12AX7	
V2	Output	6V6GT	
V3	Output	6V6GT	
V4	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	450	12011	AFH4-14	DO130	FP444	TMQ-12	Q-040	TVL-4763
B	▲20	450							
C	20	450							
D	●20	450							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	33		12047	SI33	D6-330	LT6Q33	ED-33	UC-5433	5GA-Q33	
C3	.047	400	12009	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C4	.0022	400	12049	BPD-0022	D6-222	CUB6D22	ED-0022	GEM-6222	6TM-D22	
C5	.0022	400	12049	BPD-0022	D6-222	CUB6D22	ED-0022	GEM-6222	6TM-D22	
C6	.047	400	12009	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C7	.047	400	12009	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C8	680		12039	BPD-00068	DD-681	L10T68	ED-680	UC-5368	5GA-T68	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5Meg	½	12300	B-88	A47-5Meg-Z	Q13-141	U65	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1Meg	½	11982	BB-108	AD47-1Meg-S	Q11-137	UF16L	Tone
B	1Meg	½		Not Req.	M11-137	UR16L	Tone	
C	Shaft			AK-16	KSS-3	Not Req.	DS-36	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	V-M PART No.	IRC PART No.	
R3	220K		11293	BTS-220K	
R4	3900Ω		10873-10	BTS-3900	
R5	220K		11293	BTS-220K	
R6	22K		11053	BTS-22K	
R7	22K		11053	BTS-22K	
R8	1Meg		11453	BTS-1Meg	
R9	1000Ω		10733	BTS-1000	
R10	220K		11293	BTS-220K	
R11	220K		11293	BTS-220K	
R12	470K		11373	BTS-470K	
R13	470K		11373	BTS-470K	
R14	200Ω	5	11979	PW7-200	
R15	10K		10973	BTS-10K	
R16	100K		11213	BTS-100K	
R17	470Ω	2	10655	BTB-470	
R18	47K		11133	BTS-47K	

TRANSFORMER (POWER)

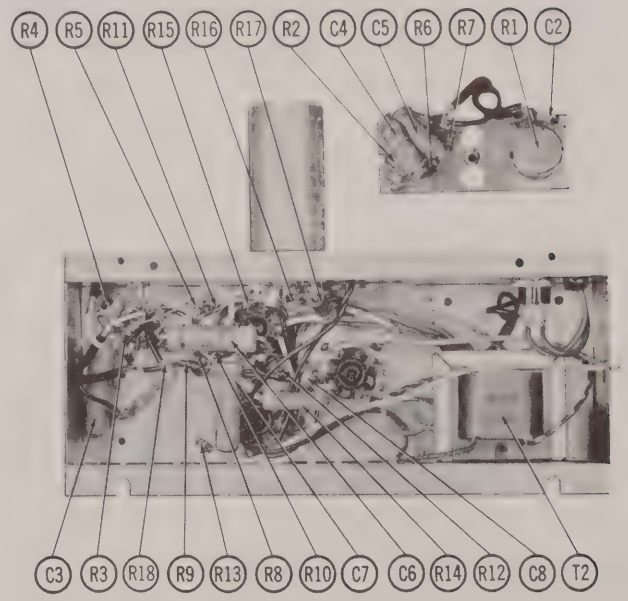
ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	V-M PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.58A	545VCT @.077A	5VAC @2A	6.3VCT @1.3A	12518-5 ①	P9204		PC8403	22R02 ②	R-8A

① Alternate Part No. 12518.
② Use Universal Mtg. Brackets.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	V-M PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6600Ω CT	3-4Ω	12519-4 ①	Z1011	A-2901②	A-3870	22S47 ②	S-55X	① Alternate Part No. 12519. ② Drill New Mtg. Hole.

CHASSIS—BOTTOM VIEW



SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	V-M PART No.	QUAM PART No.	
SP1	5" x 7"	PM	11Ω	9021-6①	57A1Z11 ①	① Parallel & Phase
SP2	5" x 7"	PM	11Ω	9021-6 ①	57A1Z11 ①	
SP3	6" x 9"	PM	12Ω	9020-6①	69A3Z12 ①	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	V-M PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	7477 ①	55-T	GD-J	56	PT-2	① Alternate Part #7316

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	V-M PART No.	JENSEN PART No.	WALCO PART No.	
M2		† S-66 or †♦ S-66SD or ♦ S-66D	† W-75TPS or †♦ W-75DS or ♦ W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M3	Pilot Light	7791	#1847
M4	Phono Motor	6945	Complete Assy. Part #6950
	Knob	6779	Models 560A-1, -2
	Knob	7690	Models 560A-3, -4

PHOTOFACT* Folder

*TRADE MARK

ZENITH MODELS Z2221RZ, U, Z2221YZ, U (Ch. 17Z30, U)

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IMPORTANT FILING NOTICE

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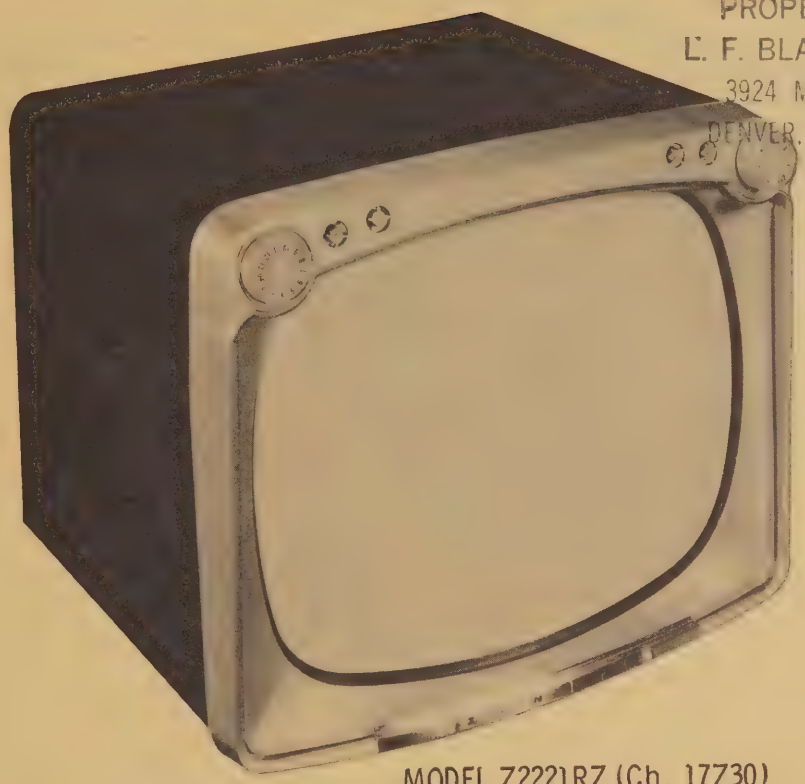
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL Z2221RZ (Ch. 17Z30)

TRADE NAME	Zenith	MODELS	CHASSIS
		Z2221RZ, Z2221YZ	17Z30
		Z2221RZU, Z2221YZU	17Z30U
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	Television Receiver		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 185 Watts, 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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ZENITH MODELS Z2221RZ, U, Z2221YZ, U (Ch. 17Z30, U)

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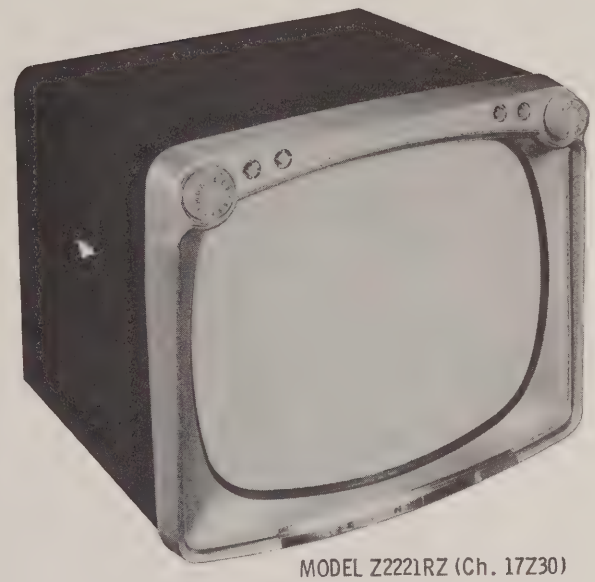
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 metal screws and the rear cover.
2. Remove 2 speaker leads.
3. Remove 2 metal screws from the top chassis bracket.
4. Remove 2 metal screws from the bottom chassis bracket.
5. Remove 1 metal screw at the lower left corner of the chassis.
6. Remove the chassis from the front of the cabinet.
7. Remove 2 speaker nuts and the speaker.



MODEL Z2221RZ (Ch. 17Z30)

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DENVER, COLORADO

MODELS	CHASSIS
Z2221RZ, Z2221YZ	17Z30
Z2221RZU, Z2221YZU	17Z30U

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 7 o'clock proceed in a counter clockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws holding the name plate at the bottom of the safety glass. Remove the safety glass.

SPECIAL ADJUSTMENTS

A. Focus

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10 or 6 and 2. Readjust the ion trap for the best focus consistent with maximum brightness.

B. Width

The width may be varied by means of a metallic sleeve located between the yoke and the picture tube neck. Adjust sleeve in or out of the yoke for a picture SLIGHTLY larger than necessary to fill the screen.

C. AGC

Observe the picture and advance the AGC control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

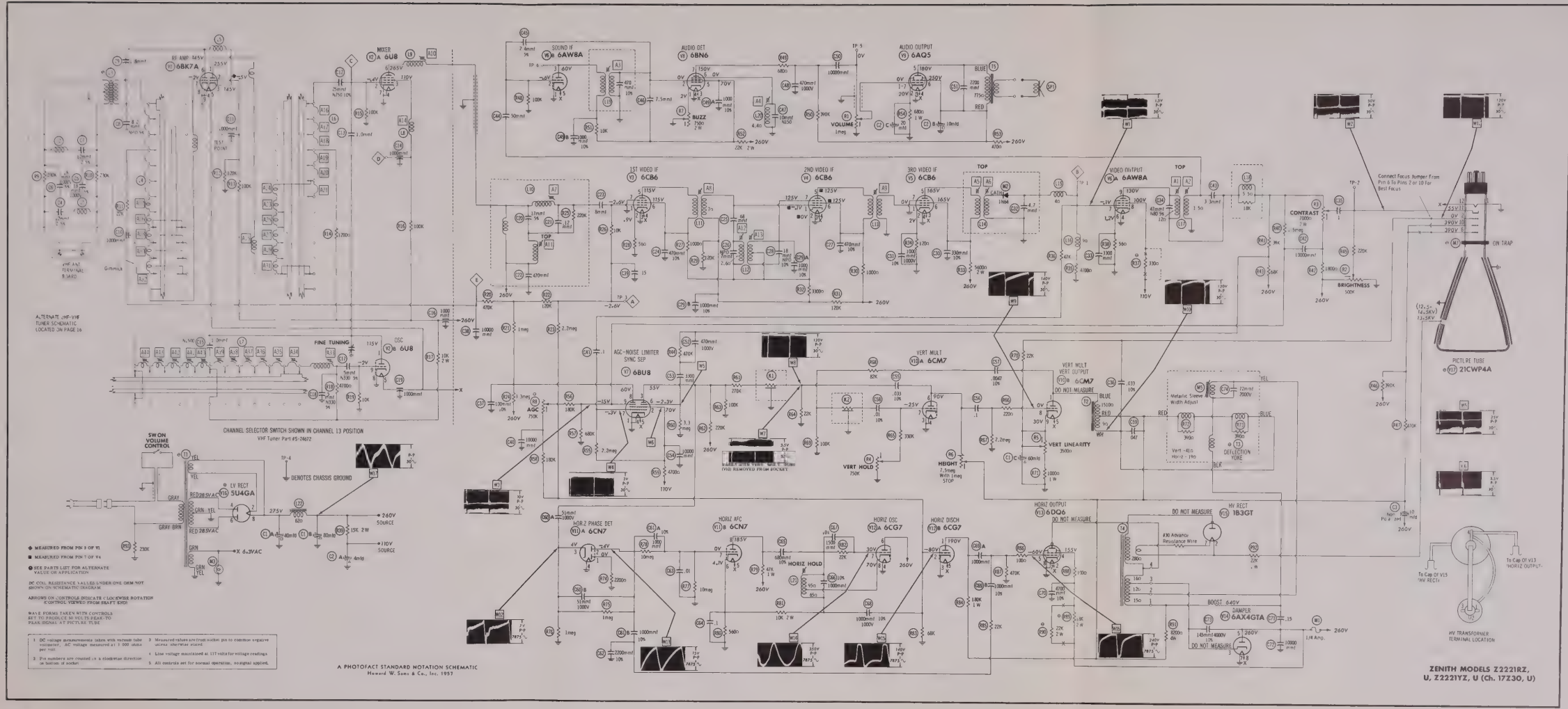
CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

ZENITH MODELS Z2221RZ, U, Z2221YZ, U (Ch. 17Z30, U)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1957 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America


ALTERNATE UHF-VHF TUNER SCHEMATIC LOCATED ON PAGE 16
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF Tuner Part #5-24672
SW ON VOLUME CONTROL
DENOTES CHASSIS GROUND
◆ MEASURED FROM PIN 3 OF V1
■ MEASURED FROM PIN 7 OF V4
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 90 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1 000 ohms per volt.
2 Pin numbers are counted in a clockwise direction on bottom of socket.
3 Measured values are from socket pin to common negative unless otherwise stated.
4 Line voltage maintained at 117 volts for voltage readings.
5 All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1957
ZENITH MODELS Z2221RZ, U, Z2221YZ, U (Ch. 17Z30, U)

TUBE PLACEMENT CHART

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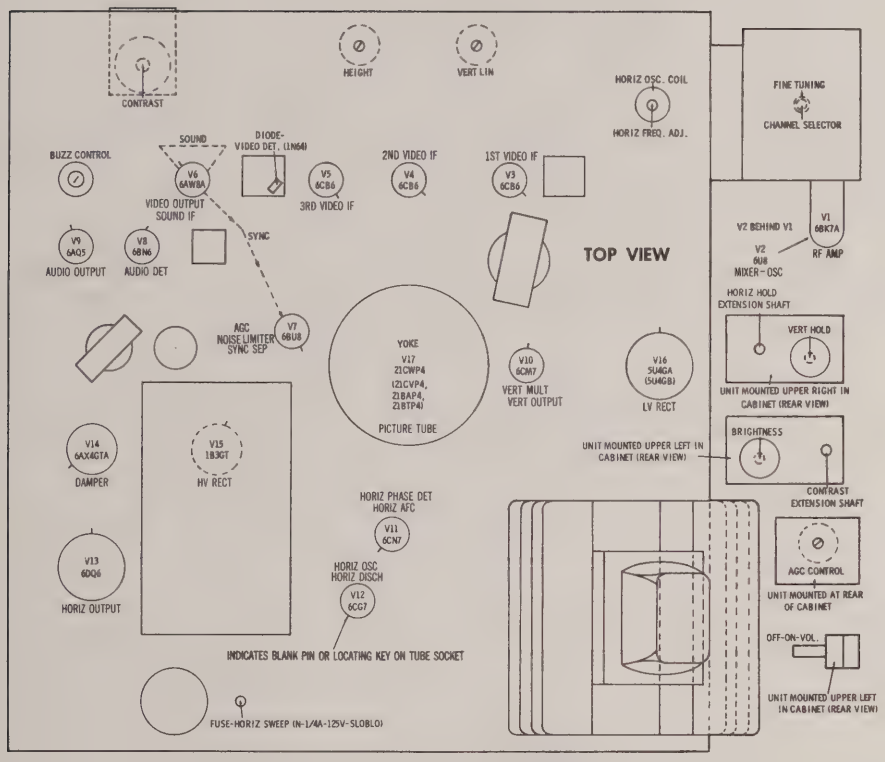


TUBE FAILURE CHECK CHART

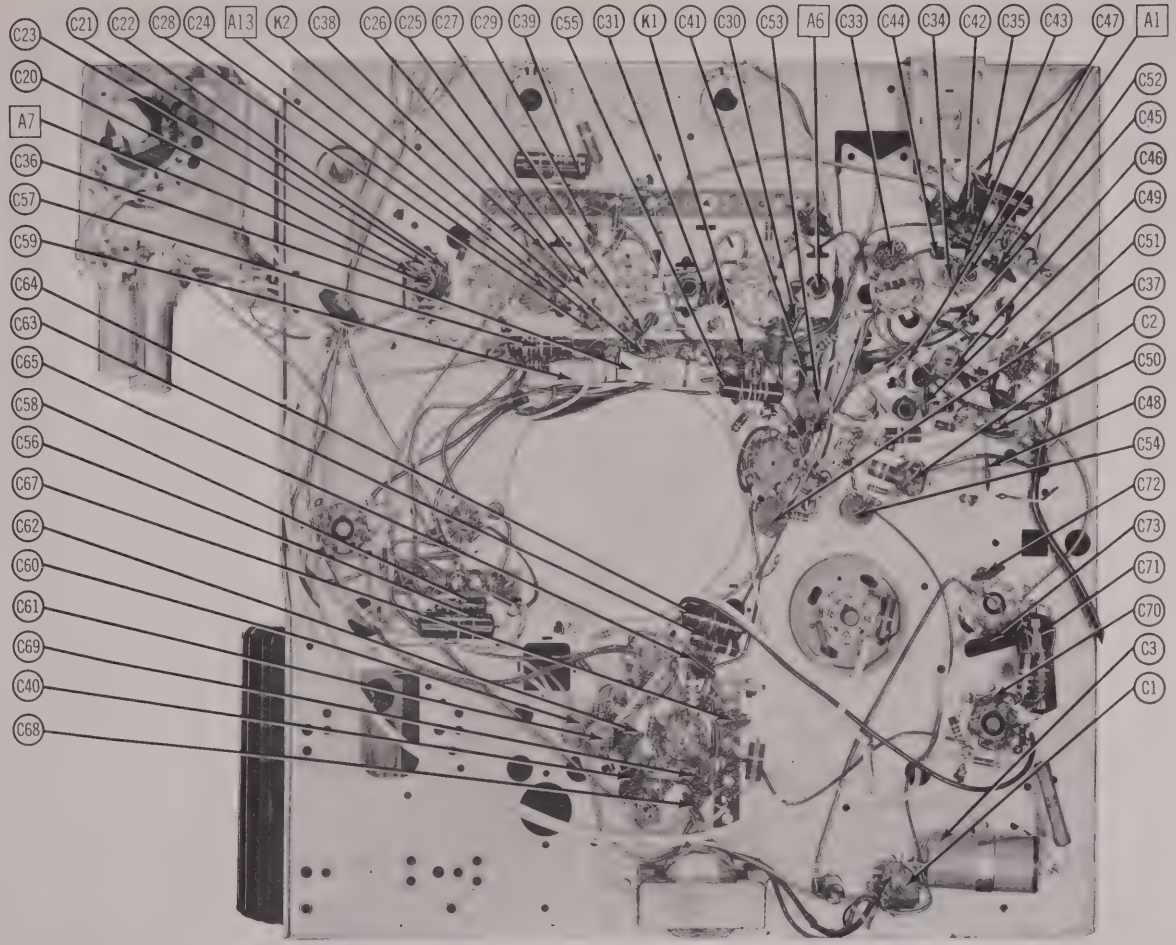
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V16**

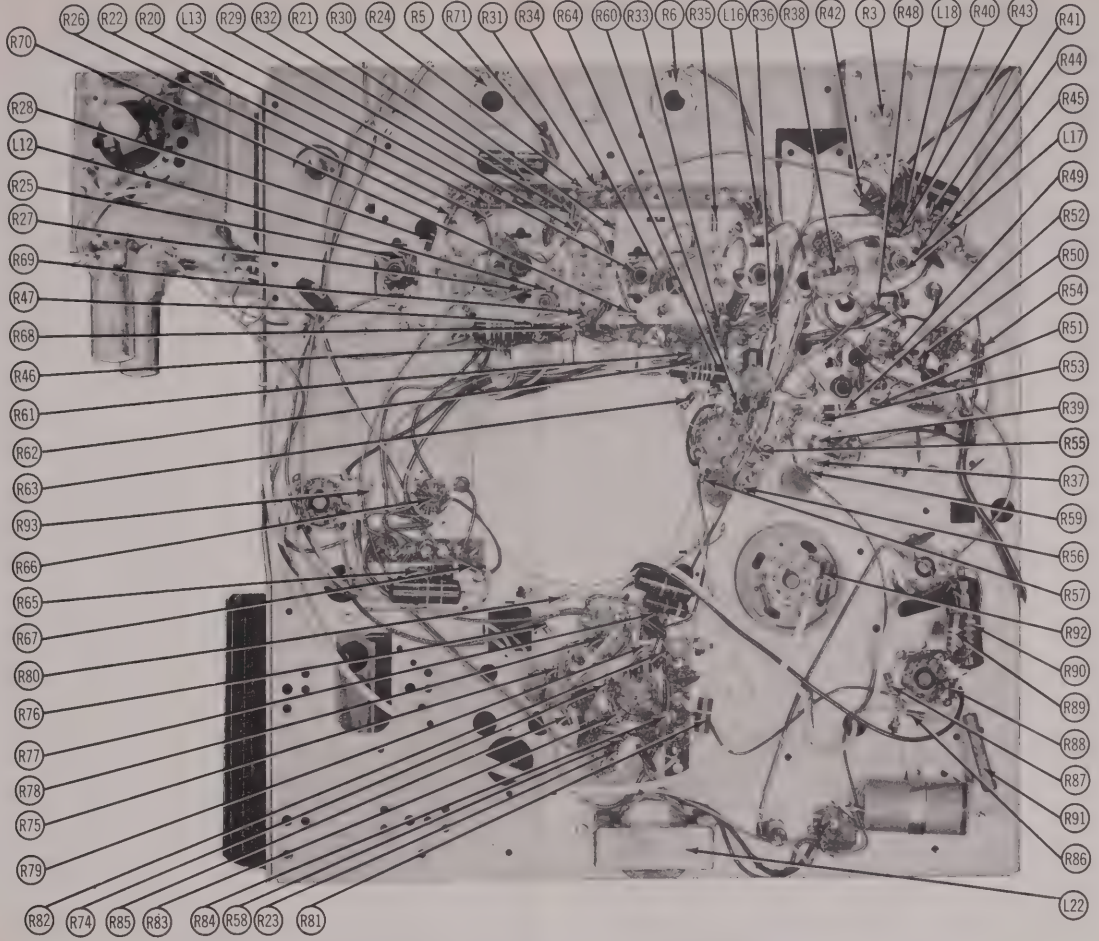
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M2), V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V17**
Has pic, no sound - **V6, V8, V9**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V7**
No horiz. sync - **V7, V11**
No vert. or horiz. sync - **V7**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15, V17**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V16**
Vert. off freq. - **V10**
Horiz. off freq. - **V12**



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



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CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The High Voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal oscillator tube (V13) to disable the high voltage.

SOUND IF ALIGNMENT

Connect an attenuator (Zenith #S-17203 or equivalent) in series with the antenna. Tune in a modulated TV signal and adjust the attenuator until the signal falls below the limiting level of the 6BN6 (V8) as evidenced by a hiss in the sound similar to super-regeneration. Adjust A1, A2, A3 and A4 for maximum sound and best quality. Adjust the Buzz control (R7) for MINIMUM buzz. If the signal rises above the limiting level of the 6BN6 during the alignment, increase the attenuation until the hiss reappears.

VIDEO IF ALIGNMENT

Remove the mixer-oscillator tube (V2) from its socket and connect a wire to pin 9 (Grid) of the tube. Place the tube back in its socket and connect the loose end of the wire to chassis.
Connect the negative lead of a 6 volt bias supply to point Ⓐ. Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 1	High side thru network (Fig. 1) to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	44.0MC (10MC Swp)	41.25MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A5, A6	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.
2.	"	High side to point Ⓒ. Low side to chassis.	"	41.25MC 42.75MC 45.0MC 45.75MC 47.25MC	"	"	A7, A8, A9, A10	Adjust for maximum gain and symmetry of response similar to Fig. 3. with markers as shown. A7 affects peak of curve, A8 affects low frequency side and A9 and A10 affect high frequency side.
3.	"	"	"	47.25MC	"	"	A11, A12	Switch scope to 10X gain used in steps 1 and 2. Adjust A11 and A12 for maximum attenuation at 47.25MC marker as in Fig. 4.
4.	"	"	"	40.5MC	"	"	A13	Switch scope gain back to where it was in steps 1 and 2. Remove bias supply. Adjust A13 for maximum displacement of the 40.5MC marker as in Fig. 5. Do not exceed the displacement of the 41.25MC marker.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2 volt bias supply to point E. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	50Ω to 300Ω Matching Trans.	Across antenna terminals thru matching transformer.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓓ. Low side to chassis.	A14, A15	Check for response similar to Fig. 6. If necessary, adjust A14 by expanding or compressing coil turns for proper bandwidth. Adjust A15 the same way for maximum amplitude of response curve.
6.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A16	Check for response curve similar to Fig. 6. If necessary, adjust by bending loop in or out from switch rotor for proper response.
7.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A17	"
8.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	10	"	A18	"
9.	"	"	189MC (10MC Swp)	187.25MC 191.75MC	9	"	A19	"
10.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	"	A20	"
11.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A21	"
12.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A22, A23, A24	Adjust by expanding or compressing coil turns for response similar to Fig. 6.
13.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A25, A26	"
14.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A27, A28	"
15.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A29, A30	"
16.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A31, A32	"

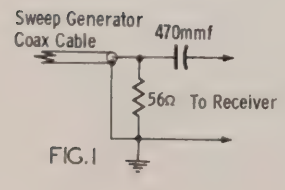


FIG. 1

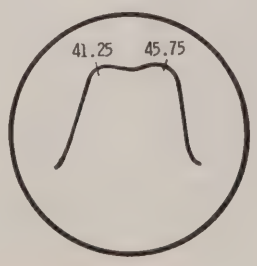


FIG. 2

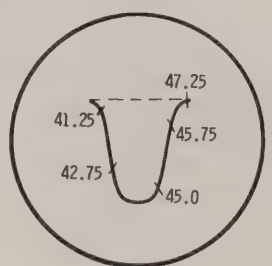


FIG. 3

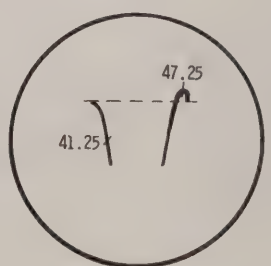


FIG. 4

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point (B). Low side to chassis.	A33	Adjust to place sound marker in trap notch as in Fig. 7. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A34	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A35	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A36	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A37	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A38	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A39	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A40	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A41	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A42	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A43	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A44	

UHF TUNER ALIGNMENT

Alignment of the UHF tuner should not be attempted without the proper test equipment.
Connect the negative lead of a 2 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Fig. 8	Across UHF antenna terminals thru matching network (Fig. 8).	713MC (10MC Swp)	711.25MC	54	Vert. Amp. thru 10K to point (B). Low side to chassis.	A45, A46, A47	With the UHF tuning knob set to channel 54, the rocker arm on the tuner should be in the horizontal position. If necessary, loosen set screw and turn the shaft independently of the pulley until the arm is in the horizontal position with the channel indicator on channel 54. Tighten the set screw. If the calibration is off more than 3 channels, adjust A45 to place video marker at 50% on curve as in Fig. 9. The image (weaker response) will appear also. The response toward counter clockwise position of A45 is the proper response. Adjust A46 and A47 for maximum amplitude of response similar to Fig. 9.
19.	"	"	473MC (10MC Swp)	471.25MC	14	"		Check for response similar to Fig. 9. If the oscillator is off more than 3 channels, adjust the oscillator travel adjustment (osc., mixer and antenna travel adjustments are the three hex nuts on top of the UHF tuner next to tuner chassis) to scale. Care must be used when making this adjustment so as not to move the rocker arm out of its bearing . Set the mixer and antenna travel adjustments for maximum response on scope.
20.	"	"	887MC (10MC Swp)	885.25MC	83	"	A48, A49, A50	Adjust A48 to place marker at 50% on curve similar to Fig. 9. Adjust A49 and A50 for maximum amplitude and symmetry.

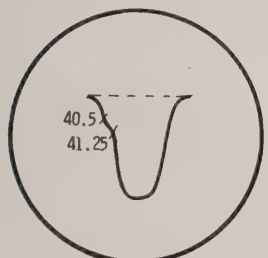


FIG. 5

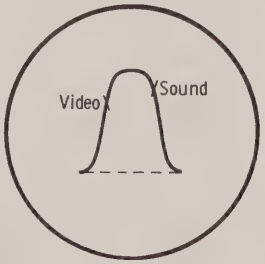


FIG. 6

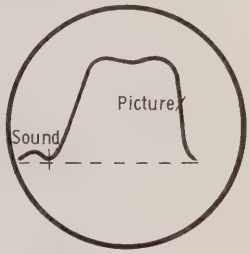


FIG. 7

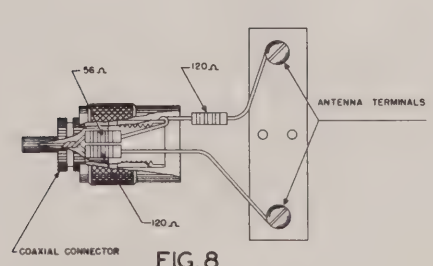


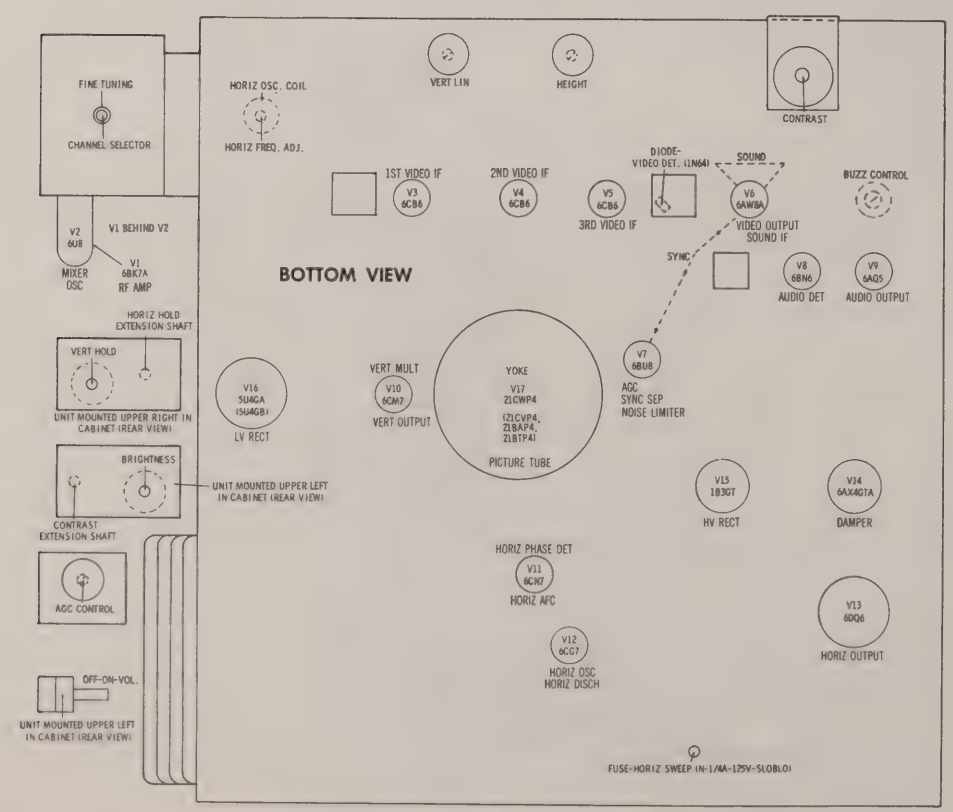
FIG. 8

FIG. 9

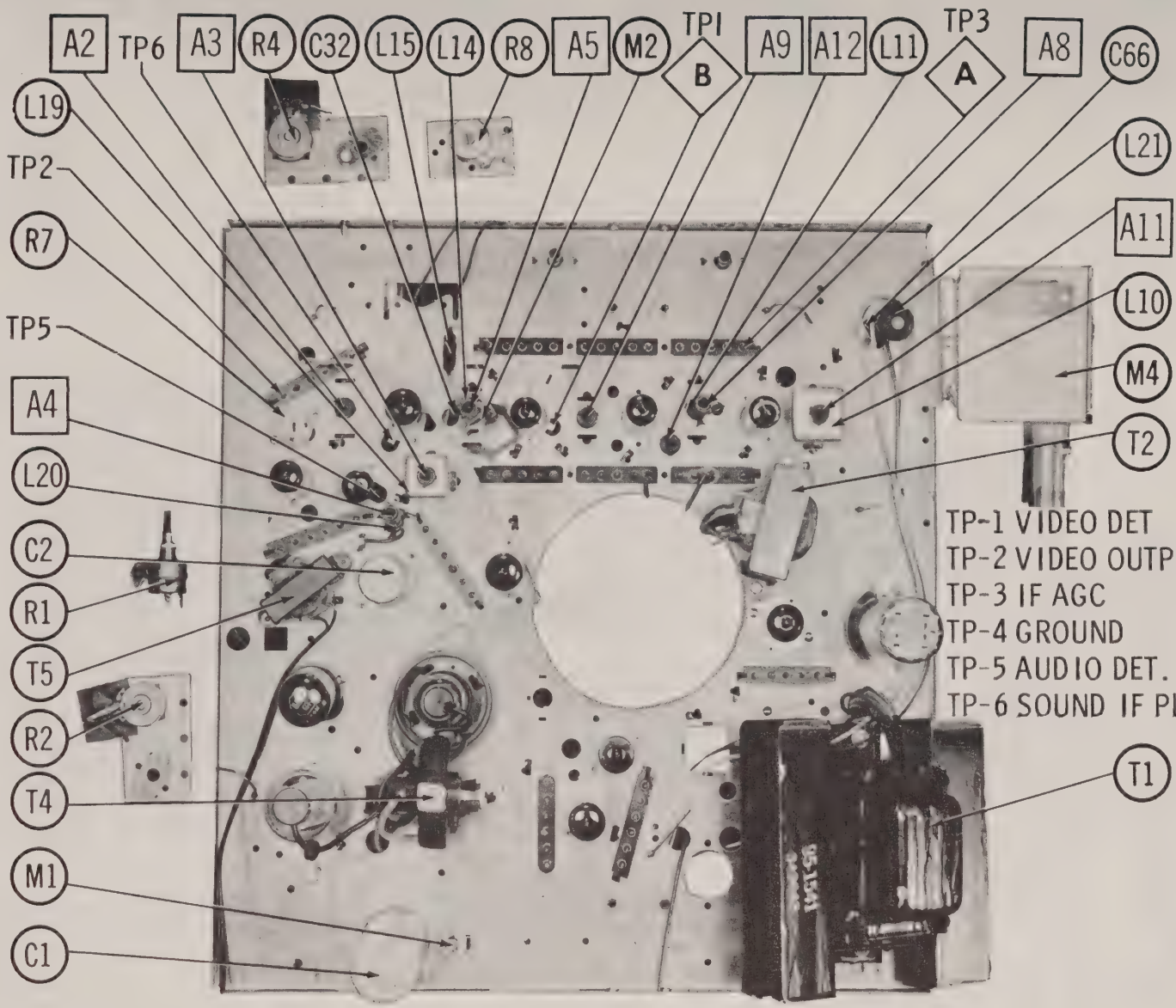
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BK7A	†1200Ω	55K	INF	0Ω	.1Ω	INF	1.8Meg	0Ω	0Ω
V2	6U8	†10K	100K	†100K	0Ω	.1Ω	†62Ω	0Ω	0Ω	10K
V3	6CB6	1.4Meg	56Ω	0Ω	.1Ω	■ 1000Ω	■1000Ω	0Ω		
V4	6CB6	■ 3300Ω	■ .3Ω	0Ω	.1Ω	†1000Ω	†1000Ω	60K		
V5	6CB6	.1Ω	120Ω	.1Ω	0Ω	†5600Ω	†5600Ω	0Ω		
V6	6AW8A	0Ω	100K	†32K	0Ω	.1Ω	56Ω	4700Ω	†15K	†8000Ω
V7	6BU8	0Ω	†20K	†60K	0Ω	.1Ω	3.3Meg	†2.2Meg	†1.6Meg	• 280K
V8	6BN6	• 280Ω	.4Ω	.1Ω	0Ω	†22K	4.4Ω	†390K		
V9	6AQ5	• 0Ω	680Ω	0Ω	.1Ω	†1300Ω	†530Ω	• 0Ω		
V10	6CM7	‡10K	TP	0Ω	0Ω	.1Ω	• ‡4.5Meg	• 550K	2.2Meg	• 2000Ω
V11	6CN7	2200Ω	2Meg	1Meg	0Ω	.1Ω	560Ω	4.5Meg	†47K	NC
V12	6CG7	‡190K	68K	0Ω	0Ω	.1Ω	†62Ω	32K	10K	NC
V13	6DQ6	TP	.1Ω	TP	†10K	470K	TP	0Ω	0Ω	TOP CAP ‡16Ω
V14	6AX4GTA	TP	NC	¶	NC	†62Ω	NC	0Ω	.1Ω	
V15	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡296Ω
V16	5U4GA	NC	¶	TP	31Ω	TP	28Ω	NC	¶	
V17	21CWP4	0Ω	• 24K	PIN 6 †300K	PIN 10 †300K	PIN 11 • 250K	PIN 12 .1Ω			

■ MEASURED FROM PIN 7 OF V4.
† MEASURED FROM PIN 8 OF V16.
‡ MEASURED FROM PIN 3 OF V14.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



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3924 MEADE St.
DENVER, COLORADO

CHASSIS TOP VIEW

ZENITH MODELS Z2221RZ, U, Z2221YZ, U (Ch. 17Z30, U)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BK7A	
V2	Mixer-Oscillator	6U8	
V3	1st Video IF Amp	6CB6	
V4	2nd Video IF Amp	6CB6	
V5	3rd Video IF Amp	6CB6	
V6	Video Output-Sound IF Amp	6AW8A	
V7	AGC - Noise Limiter - Sync Sep	6BU8	
V8	Audio Detector	6BN6	
V9	Audio Output	6AQ5	
V10	Vert. Mult. - Vert Output	6CM7	
V11	Horiz. Phase Det. - Horiz. AFC	6U7	
V12	Horiz. Osc. -Horiz. Discharger	6CG7	
V13	Horiz. Output	6DQ6	
V14	Damper	6AX4GTA	
V15	HV Rectifier	1B3GT	
V16	LV Rectifier	5U4GA	Note 1

Note 1. Some versions may use a 5U4GB in this application.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA			NOTES
	ZENITH PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V17	21CWP4A		21CWP4 ‡	‡ Silver screen ‡‡ Aluminized
	21CYP4			
	21AP4 ‡		21AP4 ‡	
	21RTP4			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	ZENITH PART No	ARVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1A	40	400	23-2743	AFH4-58-75	-BM40	-FP229 4	-TMD-38	-D-255	R2285 *
B	80	450			-BM80S	-TC84	-TD-80-350	-MD-1530	
C	80	50							
C2A	15	350	23-2744	AFH3-180	-BC820	-FP171	-TMD-72	-D-245	R3416 *
B	40	400			-BM40	-TC90	-TD-4-450	-FM-4504	
C	30	25				-TC26			
C3	10	400	23-2870 *	NP-PR6400	V10	-TC75 †		-MT-4520 †	R2286 *
						-TC73 ‡		-MT-4520 ‡	

* Non-catalog item
\+ Non-polarized unit
† Connect negative leads together

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	ZENITH PART No	ARVOXCAP PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No
C4	.13	1200	23-3679		TCZ-13		TCO-13		
C5	.18	1200	23-3680		TCZ-18		TCO-18		
C6	.18	1200	23-3680		TCZ-18		TCO-18		
C7	.13		23-3679		TCZ-13		TCO-13		
C9	8.2		23-3081	NPO-SI 8.2			TCO-8.2		
C9	1.8		23-3438						
C10	1000		23-3689	EF-001	MPT-1000			503C-DI	
C11	1000		23-3689	EF-001	MPT-1000			503C-DI	
C13	15		23-3671	NT50-SI 15	TCN-15		TCT-15		N750 10%
C14	1.8		23-3720	NPO-SI 1.8	TCZ-1.8		TCO-1.8		
C14	1000		23-3689	EF-001	MPT-1000			503C-DI	
C15	1.8		23-3764						
C16	1000		23-3689	EF-001	MPT-1000			503C-DI	N1500
C17	5		23-2716						N330 5%
C18	5		23-2716						N330 5%
C19	1000		23-3689	EF-001	MPT-1000			503C-DI	5%
C20	17		23-2594						
C21	12		23-1948						
C22	470		23-6	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47
C23	470		23-6			BYA10T47	ED-470		
C24	470		23-16		DD-471	LI07T47	ED-470		10%
C25	85		23-1766		TCN-S688		TCN-85		
C26	7		23-2513			C30Y7C			N70
C27	470		23-16		DD-471	LI07T47	ED-470		10%
C28	18		23-2980		TCZ-18	C30Q18C	TCO-18		N70 10%
C29A	1000		23-21				ED-1000		10%
B	1000						ED-1000		10%
C30	330		23-2897	9409-00089	DS-321	SR5T333	ED-330		MS-333 10%
C31	1000		23-17				ED-1000		
C32	4.7		23-2867	NP0-SI 4.7	TCZ-4R7	C10V47C	TCO-4.7	CZ-5547	STCCB-V47
C33	3300		23-11	BPD-0033	DD-333	BYA10G33	ED-0033	UC-5233	SHK-D33
C34	47		23-2467						N80 5%
C35	1	200	23-1777	P388N-1	DF-104	CU82P1		GEM-201	2TM-P1
C36	.033	600	23-2225					GEM-6133	
C37	100		23-9		LI0TI		ED-100		10%
C38	10000		23-3	BPD-DI	DD-103	BYA501	ED-01	DC5U1	SHK-BI
C39	33	300	23-2147	P388N-15		CU82P15		GEM-2015	2TM-P15
C40	10000		23-3	BPD-DI	DD-103	BYA501	ED-01	DC5U1	SHK-BI
C41	33	300	23-1777	P388N-1	DF-104	CU82P1		GEM-201	2TM-P1
C42	10000		23-3	BPD-DI	DD-103	BYA501	ED-01	DC5U1	SHK-BI
C43	3.3		23-2243	NP0-SI 3.3	TCZ-3R3	CTA6V33C	TCO-3.3	ZT-5533	STCCB-V33
C44	50		23-2460	SI 50	D5-500	C30Q5C	TCO-50	SGA-5Q	STCCB-V50
C45	2.4		23-2596	NP0-SI 2.2	TCZ-2R2			SGA-Q8	STCCB-V22
C46	7.5		23-2742					SGA-7Q5	
C47	10		23-2721						N150
C48	470	1000	23-6	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47
C48A	1000		23-21				ED-1000		10%
B	1000						ED-1000		10%
C50	10000		23-3	BPD-DI	DD-103	BYA501	ED-01	DC5U1	SHK-BI
C51	2200		23-8	BPD-0022	DD-222	BYA10D22	ED-0022	UC-5222	SGA-D22
C52	470	1000	23-6	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47
C53	3300		23-11	BPD-0033	DD-333	BYA10D33	ED-0033	UC-5233	SGA-D33
C54	10000		23-3	BPD-DI	DD-103	BYA501	ED-01	DC5U1	SHK-BI
C55	.033	400	23-2025						
C56	.1	600	23-2026	P488N-1	DF-104	CU84P1		GEM-601	4TM-P1
C57	.0047	600	23-1849						10%
C58	.01	400	23-2595						10%
C59	.047	200	23-1778	BPD-05	DF-503	CUB3S47		GEM-3147	2TM-S47
C60A	SI	1000	23-25	SI SI	DD-500	L10Q5I	ED-SI	UC-545	SGA-Q5
B	SI	1000		SI SI	DD-500	L10Q5I	ED-SI	UC-545	SGA-Q5
C61A	1000		23-21				ED-1000		10%
B	1000						ED-1000		10%
C62	2200		23-19						
C63	.01	400	23-2209	BPD-DI	DD-103	CU84S1	ED-10000	GEM-611	4TM-S1
C64	.1	200	23-1777	P388N-1	DF-104	CU82P1		GEM-201	2TM-P1
C65	680		23-2969	9466-00068	D5-581	1R5T68	ED-680		MS-368 10%

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	ZENITH PART No	ARVOXCAP PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	
C66	1000		23-2153	1464-001			1R5DN		MS-31	10%
C67	1500		23-12							10%
C68	1000	1000	23-17							10%
C69A	1000		23-21				/ED-1000			10%
B	1000						/ED-1000			10%
C70	4700		23-14							10%
C71	15	400	23-2281	P488N-15		CU84P15		GEM-6015	4TM-P15	
C72	10000		23-3	BPD-01	DD-103	BYA681	ED-01	DC5U1	5HK-BI	
C73	143	4000	23-2889							
C74	73	3000								10%

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No	CENTRALAB PART No	IRC PART No	MALLORY PART No	
R1A	1Meg	1	63-3636	B-70	A47-1Meg-S	U51-137	Not Req.	Volume
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	
C	Switch			X3-1	SWE-12	TF-1	U31-26	
R2	500K	1	63-3671	B-61	Q17-133	TA58R		Brightness
R2A	1000Ω	2	63-3388	WW-753 *	A43-7500 *	WWK7500 *	R7500L *	Contrast - wire wound
B	Shaft			Not Req.	F8-3	Not Req.	D8-36	
R4A	750K	1	63-3672	B-68	A47-750K-S	Q11-136	U54	Vert. Hold
B	Shaft			Not Req.	R58-3	Not Req.	Not Req.	
R5A	3500Ω	1	63-3295	AB-9	A47-4000-S	Q11-114	PTA352L	Vert. Lin.
B	Shaft			AK-1	FKH-1/2	TQ	Not Req.	
R8A	7.5Meg	1	63-3294	AB-69 †	A47-7.5Meg-S ††	Q11-142 †	PTA356L †	Height with 1Meg stop
B	Shaft			AK-1	FKH-1/2	TQ	Not Req.	
R7	750Ω	2	63-3284		39-800		FL-780	Buzz - wire wound
R8A	750K	1	63-3283			111-126	PTA754L	AGC - Note 1
B	Shaft					TM2-K31	Not Req.	

* File shaft double flat.
† Use 1.1Meg resistor in series with the right hand terminal
Note 1. Alternate part #63-3668 may be used in some versions

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R9	330K			BTS-330K	
R10	330K			BTS-330K	
R11	33K			BTS-33K	
R12	180K			BTS-180K	
R13	100K			BTS-100K	
R14	1300Ω			BTS-1300	
R15	100K			BTS-100K	
R16	100K	3	66-3176	BTS-100K	
R17	10K			BTS-10K	
R18	4700Ω			BTS-4700	
R19	10K			BTS-10K	
R20	470K		63-1898		
R21	1Meg		63-1181		
R22	180K		63-1873		
R23	2 Meg		63-1920		
R24	1 Meg		63-1853		
R25	220K		63-1883	BTS-220K	
R26	10K		63-1827		
R27	1000Ω		63-1788		
R28	56Ω		63-1733	BTS-56	
R29	120K		63-1873	BTS-120K	
R30	1000Ω		63-1786	BTS-1000	
R31	130K		63-1879	BTS-130K	
R32	3300Ω		63-1807	BTS-3300	
R33	5900Ω		63-3223	BTS-5900	
R34	120Ω		63-1747	BTS-120	
R35	4700Ω		63-1813	BTS-4700	
R36	47K		63-1855	BTS-47K	
R37	330Ω			BTS-330	Note 1
R38	56Ω		63-1733	BTS-56	
R39	15K	2	63-942	BTS-15K	
R40	1.5Meg			BTS-1.5Meg	
R41	39K		63-1852	BTS-39K	
R42	1800Ω		63-1796	BTS-1800	
R43	68K		63-1861	BTS-68K	
R44	470K		63-1898	BTS-470K	
R45	220K		63-1883	BTS-220K	
R46	390K		63-1894	BTS-390K	
R47	470K		63-1898	BTS-470K	
R48	100K		63-1859	BTS-100K	
R49	680Ω		63-1719	BTS-680	
R50	390K		63-1894	BTS-390K	

Note 1. Not used in some versions
Note 2. Some versions may use a single 10K, 4W (Part #63-3623) to replace R38 and R90.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R51	10K		63-1537	BTS-10K	
R52	22K	2	63-1556	BTS-22K	
R53	470Ω		63-1771	BTS-470	
R54	680Ω	1	63-3290	BTA-680	
R55	2.2Meg		63-1925	BTS-2.2Meg	
R56	180K		63-1880	BTS-180K	
R57	680K		63-1904	BTS-680K	
R58	180K		63-1880	BTS-180K	
R59	4700Ω		63-1813	BTS-4700	
R60	3.3Meg		63-1922	BTS-3.3Meg	
R61	270K		63-1887	BTS-270K	
R62	330K		63-1888	BTS-330K	
R63	100K		63-1859	BTS-100K	
R64	22K		63-1841	BTS-22K	
R65	330K		63-1890	BTS-330K	
R66	220Ω		63-1750	BTS-220	
R67	2.2Meg		63-1925	BTS-2.2Meg	
R68	82K		63-1868	BTS-82K	
R69	100K		63-1859	BTS-100K	
R70	22K		63-1842	BTS-22K	
R71	1000Ω	1	63-965	BTA-1000	
R72	390Ω				
R73	390Ω		63-1911	BTS-1Meg	
R74	3200Ω		63-1953	BTS-10Meg	
R75	1Meg		63-1911	BTS-1Meg	
R76	1Meg		63-1911	BTS-1Meg	
R77	10Meg		63-1953	BTS-10Meg	
R78	10Meg		63-1953		
R79	47K	1	63-1194	BTA-47K	
R80	680Ω	1	63-1719	BTA-680	
R81	10K	2	63-1146	BTB-10K	
R82	33K		63-1841		
R83	68K		63-1861	BTS-68K	
R84	180K	1	63-1913	BTA-180K	
R85	22K		63-1841		
R86	4000		63-1744	BTS-100	
R87	470K		63-1898	BTS-470K	
R88	100Ω		63-1744	BTS-100	
R89	18K	2		BTS-18K	Note 2
R90	22K	2		BTB-22K	Note 2
R91	8200Ω		63-3602	BTA-8200	
R92	22K	1	63-1053	BTA-22K	
R93	330K		63-1607	BTS-330K	

TRANSFORMER (POWER)

ITEM No	RATING				REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	ZENITH PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordorson PART No	Triad PART No
T1	117VAC	570VCT	5V	6.3V	95-1541 L					
	& 1.5A	& .265A	@ 3A	& 8A						

‡ Some versions may use alternate Part #95-1503 or #95-1520 in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							
		ZENITH PART No	Halldorson PART No	Merit PART No	RCA TYPE No.	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
T2	Vert. Output	95-1533	Z1807 ‡	A-2824 ‡					
T2A	Yoke-Horiz. (53MJX)	95-1453 ③	DF908 ③ ⑤	MDF-31 ⑤					
B	(80°) Vert. (37.5MH) Alt. Yoke	95-1435							
M6	Centering Device	S-22590							
T4	Horiz. Output	S-60124							

ITEM No	USE	REPLACEMENT DATA							
		ZENITH PART No	Halldorson PART No	Merit PART No	RCA TYPE No.	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
T2	Vert. Output	95-1533	Z1807 ‡	A-2824 ‡		V315 ‡	VO-101 ‡	26B78 ‡	A-113X ‡
T2A	Yoke-Horiz. (53MJX)	95-1453 ③	DF908 ③ ⑤	MDF-31 ⑤		TW6F15/47 ③ ⑤	DY-13A ③	Y-29 ⑤ †	Y-60 ⑤ ⑤
B	(80°) Vert. (37.5MH) Alt. Yoke	95-1435							
M6	Centering Device	S-22590							
T4	Horiz. Output	S-60124				X237 ‡ *	HO-271 ‡ *	FLY-118 ‡ *	

① Cut and tape blanking lead.
② Drill new mounting hole(s)
Includes resistors R73 and R73 and capacitor C74.
③ Connect horizontal damping network across #3 and #7.
⑤ Use original yoke damping network, connect horizontal output transformer terminal #2 to yoke terminal #3, horizontal output transformer terminal #1 to yoke terminal #1. Cut and form a piece of .010 gauge flat paper inside the yoke itself and support with an acetate cement, to provide an insulation between the width sleeve and the yoke proper.
⑥ Connect horizontal output transformer terminal #2 to yoke terminal #3, horizontal output transformer terminal #1 to terminal #7.
⑦ Cut and tape orange lead.
⑧ Use original mounting bracket.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
4				4	4	4	
3				3	3	3	
2				2	2	2	
1				1	1	1	
Special Note				‡	‡	‡	

‡ Install 3.3Ω in series with filament.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No	Stancor PART No.	Thordorson PART No	Triad PART No
T5	10.5K	3.4Ω	95-1483	Z1117		A-2932	A-3879	24852	S-17X

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C. IMP	ZENITH PART No	QUAM PART No	
SP1	5"	PM	3.4Ω	49-751	52A1	

COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L1	Antenna Trap	20-567	
L2	Antenna Trap	20-567	
L3	Ant Trans.	S-24644	Alternate Part #6-24645
L4	Ant. Coils	S-23641	Channels 2-13, complete wafer assy.
L5	Neut. Coil	30-633	

ITEM No.	USE	ZENITH PART No	NOTES
L6	RF Coils	S-23640	Channels 2-13, complete wafer assy.
L7	Osc. Coils	S-23639	Channels 2-13, complete wafer assy
L8	RF Choke	20-532	
L9	Mixer Plate Coil	S-24377	

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ZENITH PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	
L10	1st Video IF	S-41369				Includes trap and assembly
L11	2nd. Video IF	S-41398	17-4522 *	TV-130 *	6219 *	
L12A	4D 5MC Trap	S-41395				
B	4T 25MC Trap					
L13	3rd Video IF	S-23993	17-4523 *	TV-130 *	6219 *	
L14	4th Video IF	S-23993	17-4523 *	TV-130 *	6219 *	Includes assembly
L15	Resonant Choke	S-22444				25 Microhenries
L16	Shunt Peaking Coil	S-16015	19-3300	TV-190	6132	330 Microhenries
L17A	4.5MC Trap	S-23250				
B	1st. Sound IF					
L18	Series Peaking Coil	S-20880	19-5126 ▲		6153 ▲	137 Microhenries, wound on 1BK resistor
L19	2nd. Sound IF	S-22348				Includes Cap.
L20	Quadrature Coil	S-19020	20-1005 *	TV-121	1480 *	

* Drill new mounting hole.
▲ Parallel with 1BK resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No	Ram PART No	Thordorson PART No	
L21	160Ω		S-19743	19-1577		6324			RS-6	90-110 Millihenries

* Tapped @ 85Ω.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT /1000 C_{dc})	ZENITH PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordorson PART No	Triad PART No
L22	365A	63Ω	L 84HY	95-1376 ①	C5037 ②	C-3991 ②	C-3336 ②	36C44	C-32X

① Alternate Part #95-1536
② Drill One New Mtg. Hole.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Integrator		87-5	
K2	Integrator		87-4	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	1/4A 125V S/B	136-33	62-18	333.250 (N-1/4A-125V S/B)	346008	N1/4	HN 0 to 3/10

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ZENITH PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N64	103-18	1N60	1N64	A Video Det. (Pigtail)

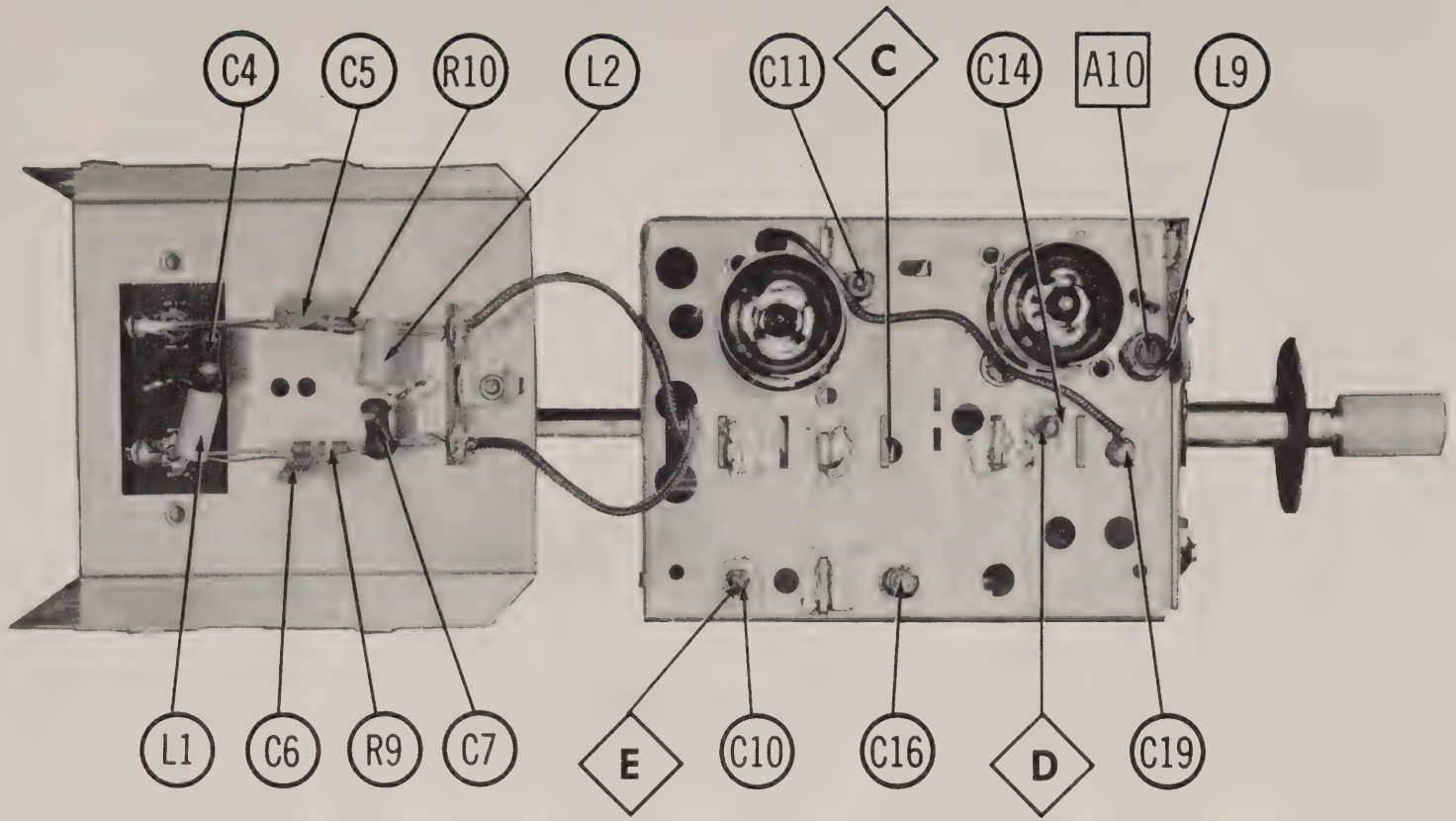
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Pilot Light	100-198	
M4	Tuner	S-24672	VHF-Chassis 17Z30
	Tuner	S-24673	VHF-Chassis 17Z30U
	Tuner	S-41363	UHF-Chassis 17Z30U
M5	Width Sleeve		
M6	Centering Device	S-22560	
M7	Ion Trap	S-22574	
	Ion Trap	S-17164	

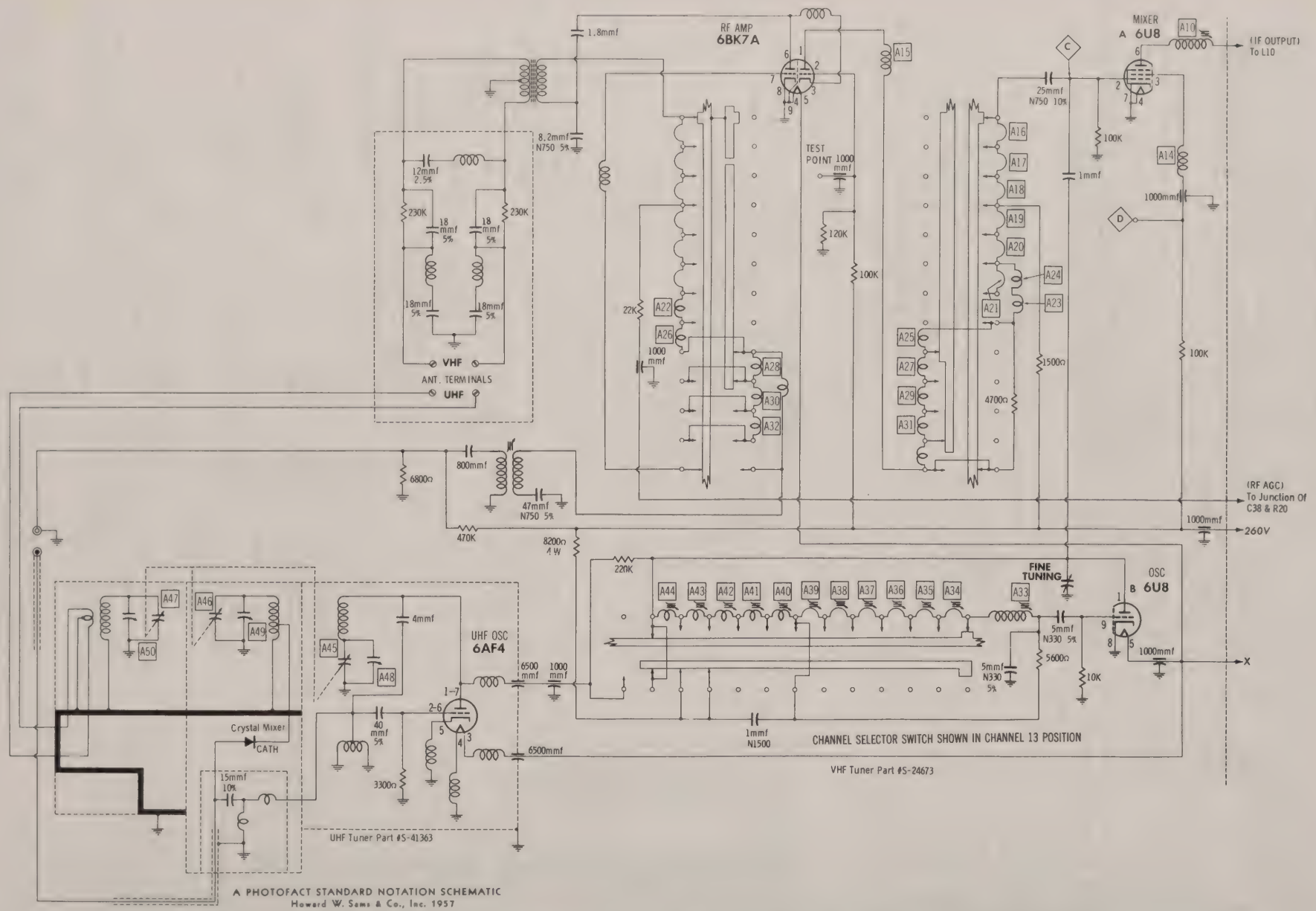
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

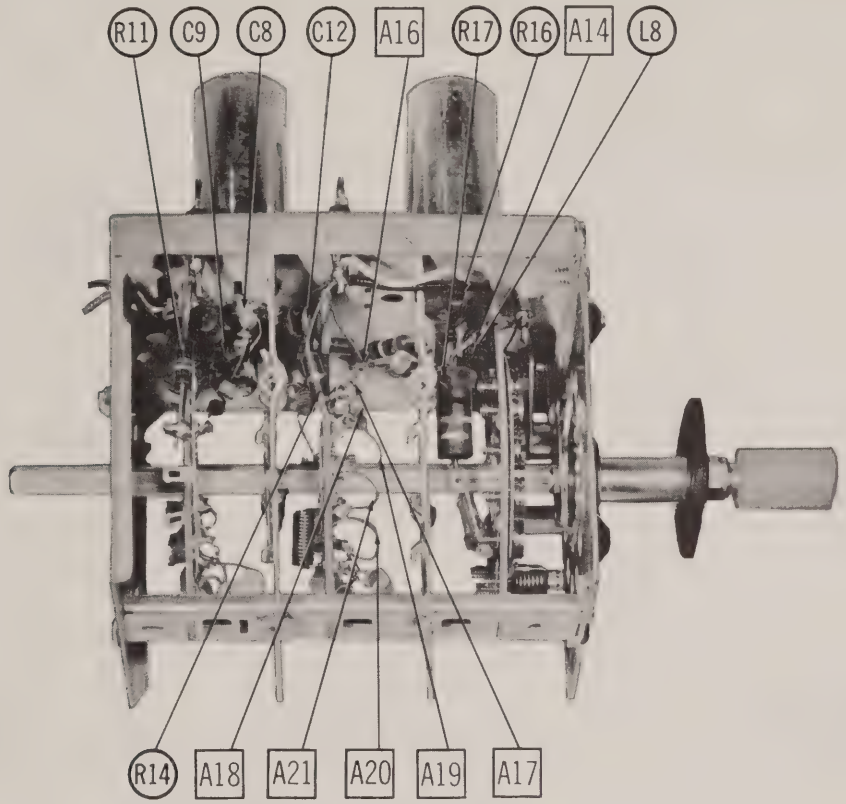
NAME	PART NO.	DESCRIPTION
Safety Glass	192-215	
Mask	57-2322	
Knob	46-1704	Channel Selector
Knob	S-22863	Fine Tuning
Knob	46-1702	On-Off-Vol.
Knob	S-40946	Horiz. Hold, Contrast
Knob	S-41058	Vert. Hold., Brightness
Knob	S-22863	UHF Tuning - UHF Versions only
Knob	S-22025	UHF Dial - UHF Versions only
Cabinet	14-2038	VHF versions only
Cabinet	14-2033	UHF versions only



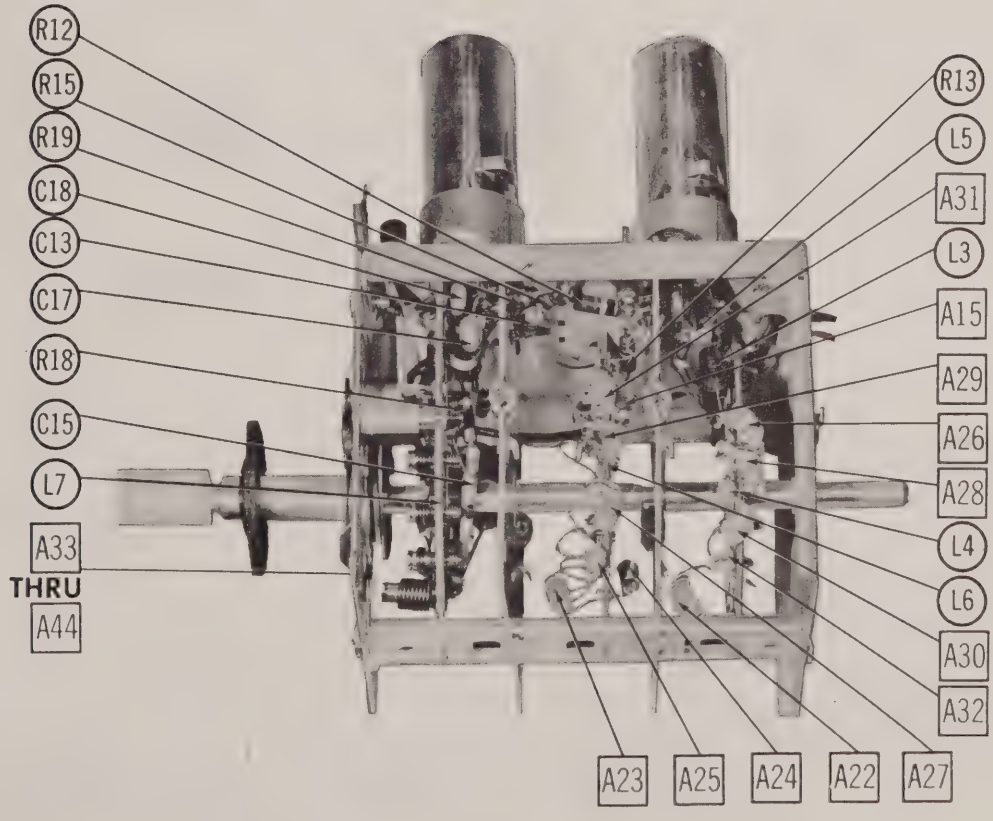
RF TUNER-TOP VIEW



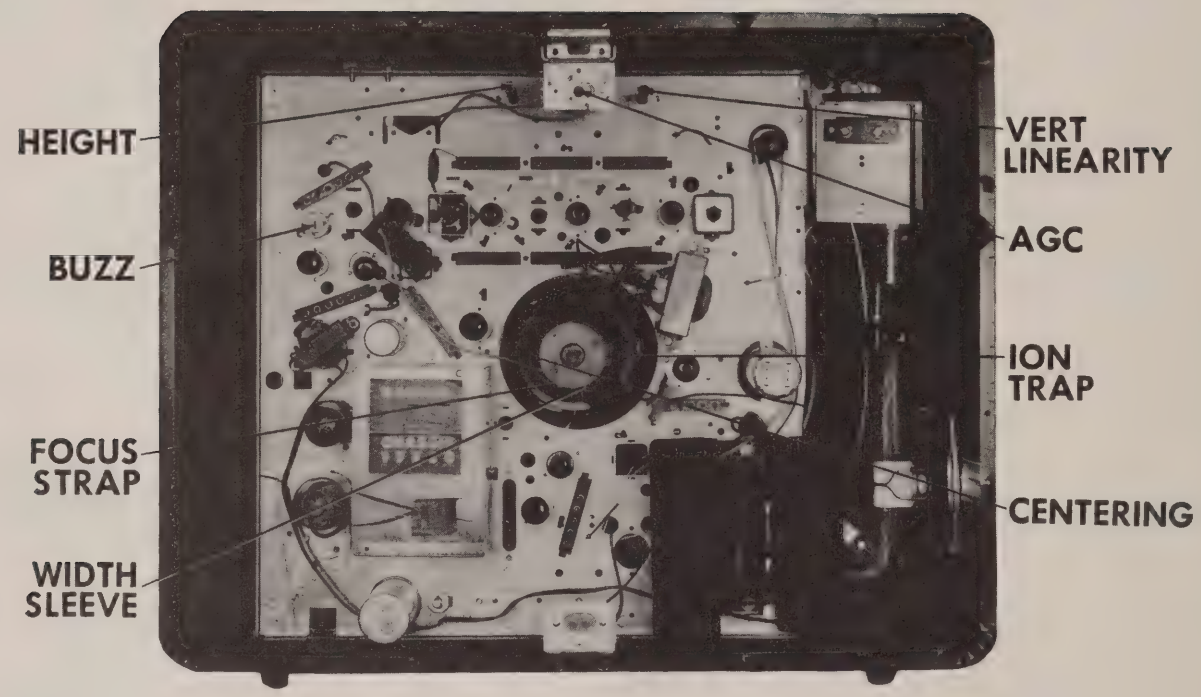
ALTERNATE TUNER SCHEMATIC



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



CABINET—REAR VIEW

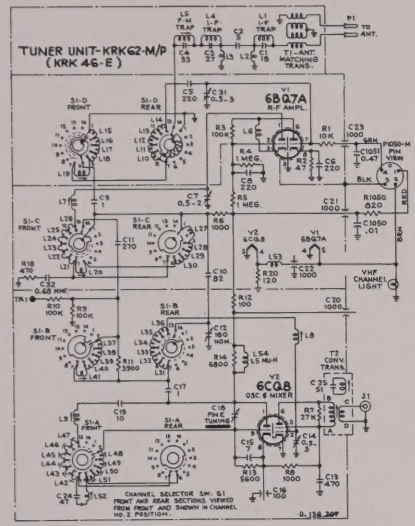
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast controls for a normal picture.

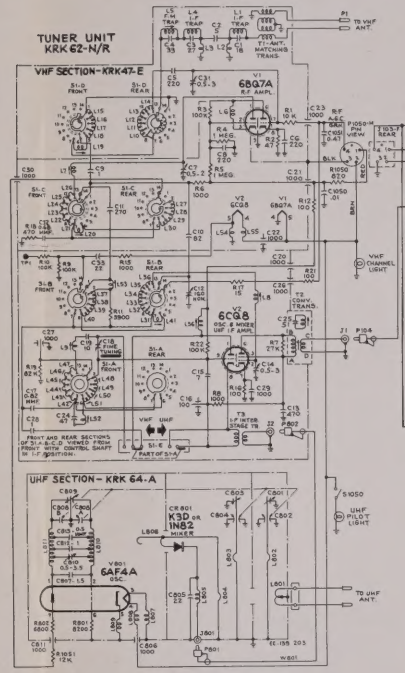
3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

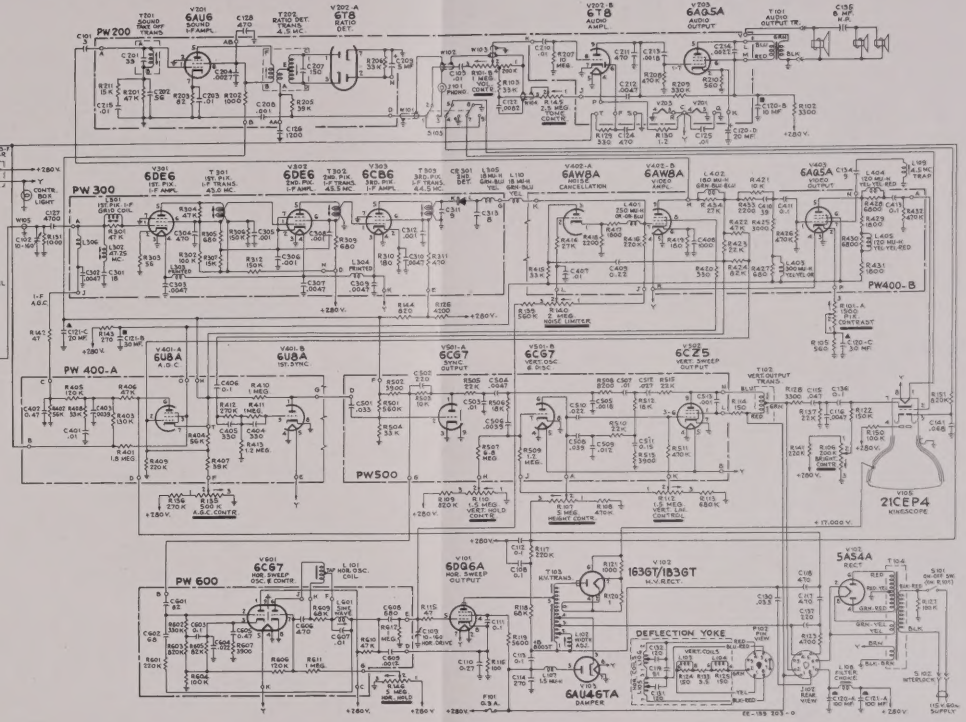
4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.



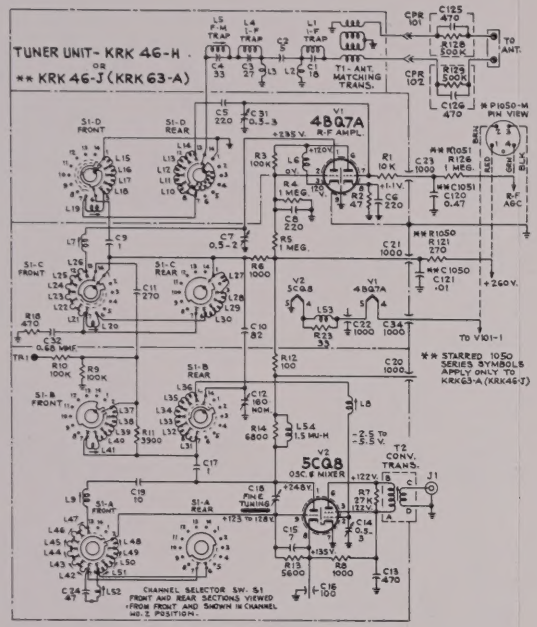
RCA MODELS

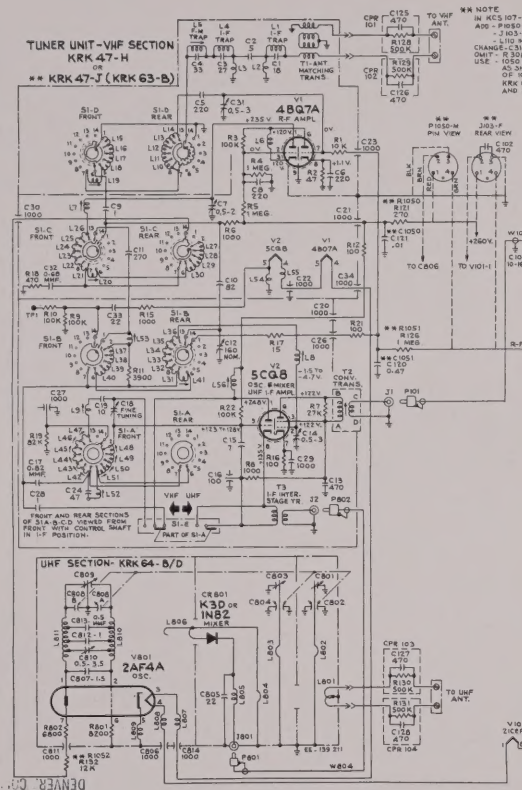
21D8525, U (Ch. KCS108C, D)
21D8526, U "
21D8527, U "
21D8528, U "
21D8545, U "
21D8546, U "
21D8547, U "
21D8565, U (Ch. KCS108E, F)
21D8566, U "
21D8567, U "
21D8588, U (Ch. KCS108C, D)
21D8605, U "
21D8607, U "
21D8608, U "

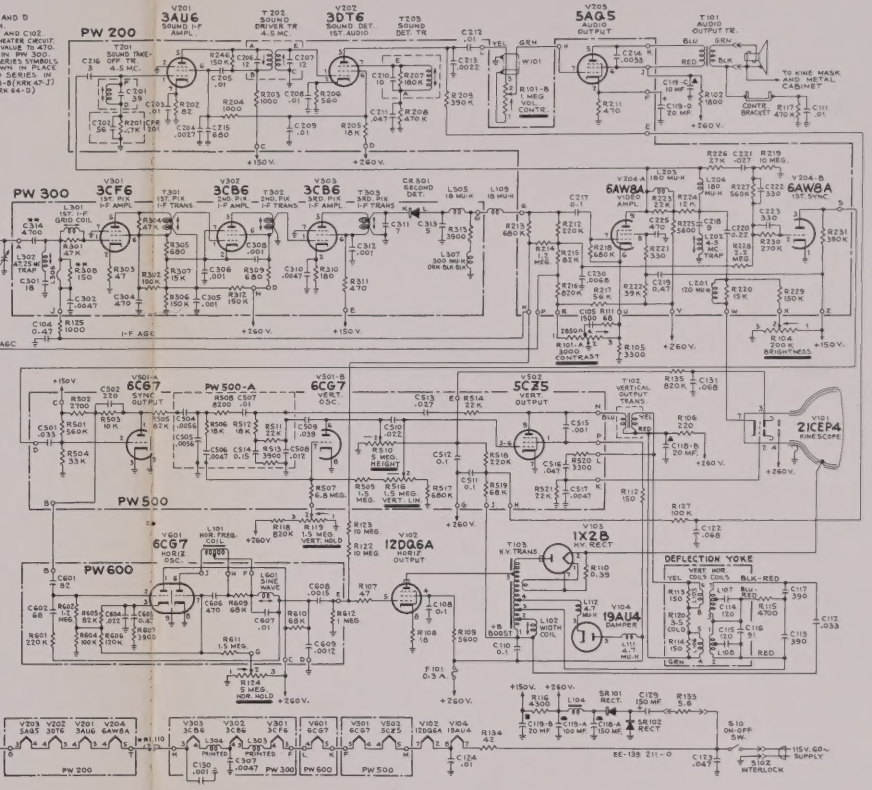




SCHEMATIC COURTESY OF RADIO CORPORATION OF AMERICA







RCA MODELS

21PD8115, U (Ch. KCS107A, B)
21T8245, U "
21T8246, U "
21T8247, U "
21T8475, U (Ch. KCS107C, D)
21T8477, U "
21T8478, U "

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DENVER, COL.

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